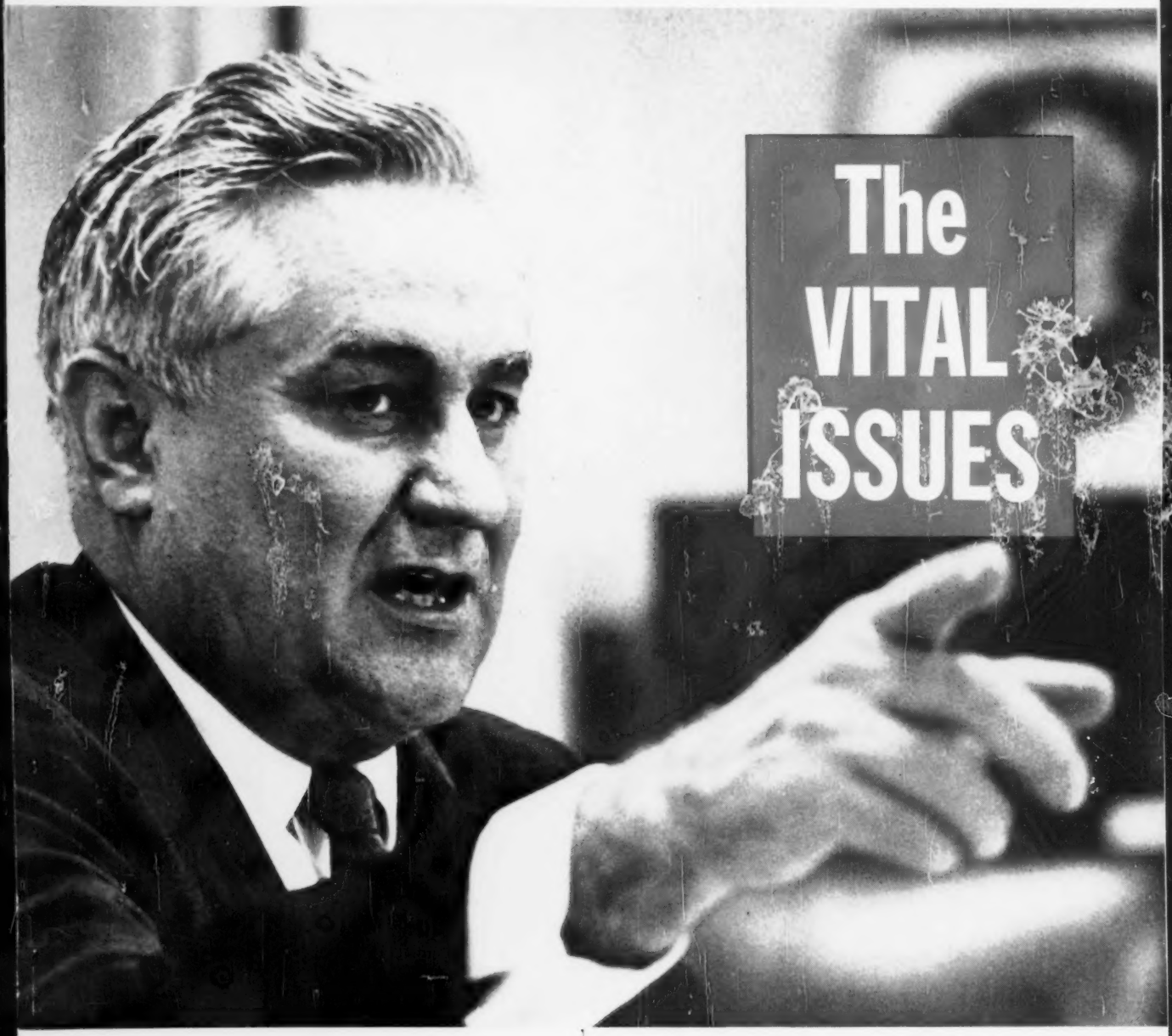
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication MAY 4, 1961



★ FTC Chairman Paul Rand Dixon

War Declared on Illegal Trade Practices p. 67

USWA's Drive in South Ohio p. 55

How Explosives Weld Metals p. 83

Digest of the Week p. 2-3

minute particles of lead...

improve surface finish

On these center aligning balls used in automotive universal joints, CHARLESTON METAL PRODUCTS switched from A.I.S.I. 52100 to the same grade of steel *leaded.** They now report improved surface finish . . . a 15% increase in tool life . . . more uniform tolerances in finished parts. They also note that wear and shock resistance are not affected and uniform high hardness (RC 62-63) is maintained. Distortion remains at a minimum.

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KNOW YOUR ALLOY STEELS . . .

This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many who may find it useful to review fundamentals from time to time.

Steel for Strength . . . Economy . . . Versatility

Determining the Proper Depth of Case in Alloy Steels

In one of the recent articles in this series we discussed the carburizing of alloy steels, pointing out that the purpose of carburizing is to provide a hard, abrasion-resistant outer shell or "case." Such a discussion naturally gives rise to the question, What factors influence the choice of case? Should it be shallow? Medium? Deep or extra-deep?

While it is not always wise to formulate hard-and-fast rules, the following may be used as a general yardstick:

Shallow cases (less than 0.02 in.). Suitable where wear-resistance alone is the chief requirement, and where good surface condition after heat-treating is advantageous. Not suitable if high stresses are apt to be encountered in service.

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If you need advice concerning case-hardened parts, let us arrange for one of our metallurgists to assist you. Bethlehem engineers are always on call, and you can depend on their recommendations. And you can depend on Bethlehem, too, when you need alloy steels; for Bethlehem makes the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

This series of alloy steel advertisements is now available as a compact booklet, "Quick Facts about Alloy Steels." If you would like a free copy, please address your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

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IRON AGE

May 4, 1961—Vol. 187, No. 18

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Indexed in Applied Science & Technology Index and Engineering Index

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The Iron Age, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only, $2 for 1 year, $3 for 2 years in U.S., Canada $10, all others $15 for one year. Latin America $25. Other Foreign $35. Single copies 50¢. Annual Issue $2. Cable: Chilton Philadelphia.

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Special This Week

FTC's Dixon Plans Crackdown

Paul Rand Dixon, new chairman of the Federal Trade Commission, plans a reorganization of this watchdog agency. The aim is to strengthen the Commission's effectiveness; speed hearings on complaints brought to its attention. This is the third of The IRON AGE's series on The Vital Issues Facing Management. p. 67

Steel Union Pushes Organizing Drive

One of the last strongholds of large independent and non-union plants is the area around Cincinnati. Now the Steelworkers Union has launched an all-out drive to organize workers in the Southern Ohio region. Armco Steel is one of the targets. p. 55

Explosive Welding Triggers Interest

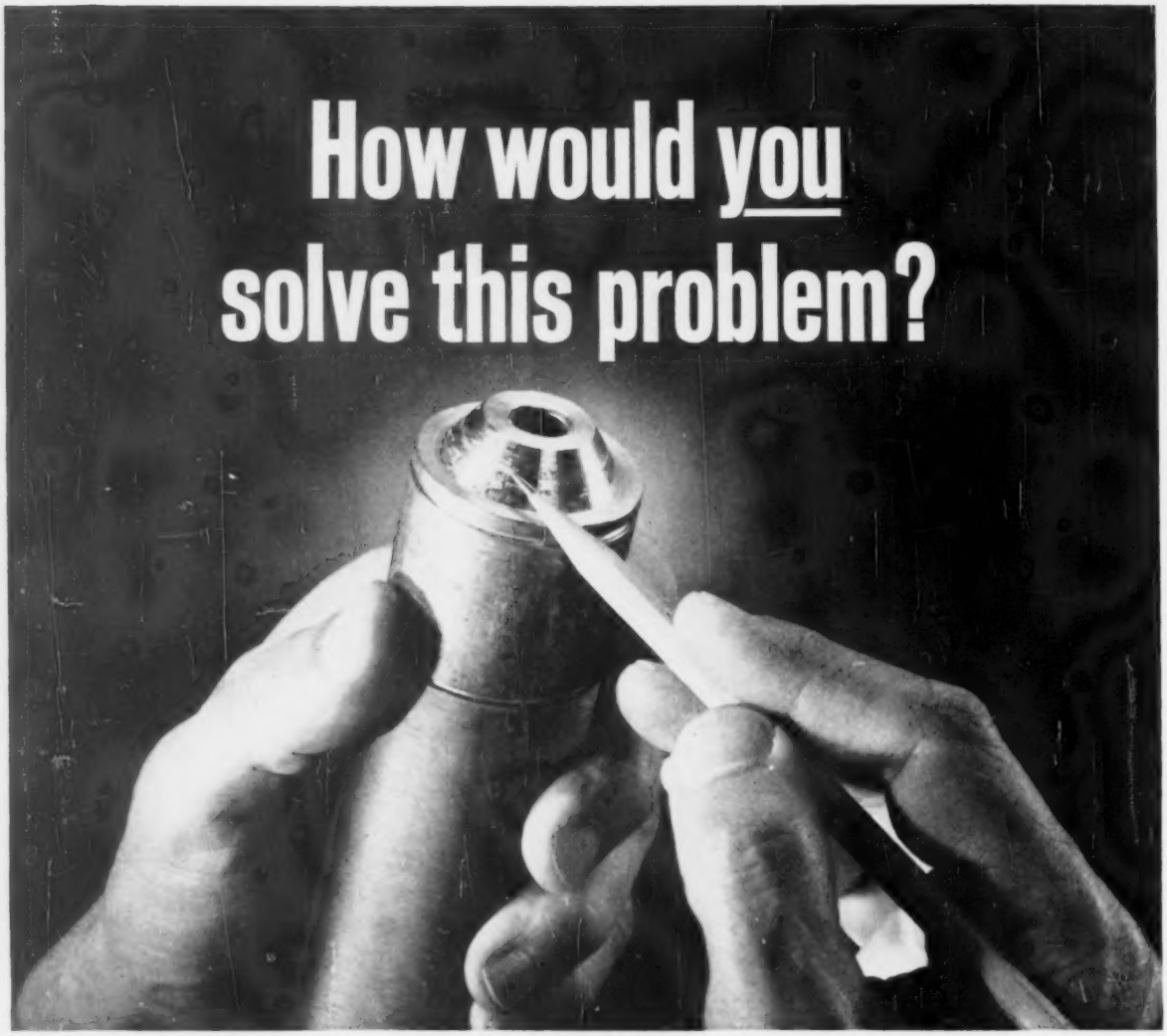
The use of explosives in metalworking is not confined to forming. Welding is in for its share of the research dollar. Most work is still in the development stages. However, rapid progress is being made in this new heat-free joining method. p. 86

Next Week

How Precision Affects Product Design

In all phases of metalworking, tolerances are getting tighter. Where does precision begin? For many jobs, you've got to maintain strict controls from the melting furnace to final fabrication. Next week's report tells how these factors influence design.

How would you solve this problem?



This roller-end component was produced from cold finished bar stock. During machining of the close-tolerance load-bearing surface, these problems were encountered: frequent tearing sent reject rate sky-high, slowed down production—and tool life was abnormally short.

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Freedom Is Dying: The Reds Are Killing It

Most of us are busy with our own affairs. So much so that we can't see that liberty is on its way out in the world.

Western nations also are too busy with their own troubles. Britain has its Commonwealth problems. France is bleeding in Algeria. West Germany fears loss of friends.

Our country has its domestic problems. Life goes on as usual—with political arguments, attention to mediocrity, cat and dog relations between labor and management.

Things are different in the other camp. Russia is reported to be having troubles with China. But that doesn't prevent a strong attempt by both to communize Cuba.

With terrible domestic problems in Russia and China, they still have time to dismember Laos. This endangers South Vietnam and Thailand.

The Cuban fiasco shows that some of our top government people have not yet matured. They continue to take—and give—information that a third-rate cloak and dagger fellow would automatically discard. But they aren't entirely to blame.

Do we, the people, try to understand the world picture? Very few of us do—or care to. We expect the President to do it all.

Are England, France, and our other allies ready to ditch their quarrelsome details so we all can fight Communism with dedication?

Freedom is dying throughout the world. It died in Hungary. It is dead in other police states because those "in charge" know how to subjugate the human mind—and spirit.

Freedom is near death in Cuba—if last week's post-mortems are true; and most appear to be true.

If we think business as usual can continue while the Reds gobble up the world mile by mile and control, lie to and demean their "captives" with cruel fairy tales, the jig is up.

There is no longer much time to discuss, argue, or debate where we are headed. We have tried distributing our wealth among the nations of the world. Most of them revile us for this. What does it take for us to realize our time is running out?

Soon, we must join the President and find some new, realistic and far-reaching answers.

Unless we do this, we are most certainly headed for oblivion.

Tom Campbell

Editor-in-Chief

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Business Horizon: Brighter, Wider

With the second quarter solidly launched, the business scene is one of contrast. This was highlighted when board chairmen and company presidents paraded before their stockholders and told of low earnings and high hopes.

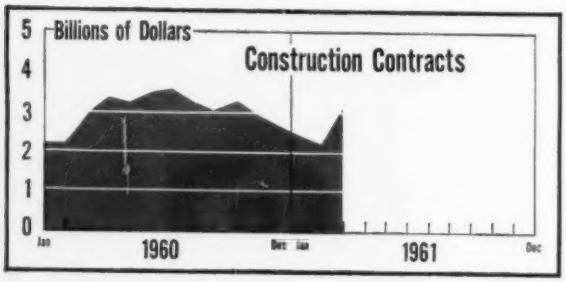
There is good foundation for their hopes. The upturn is spreading, wiping out mixed signs in the economy. And it is firming.

Some of the news is charted on this page. Some other signs: Stabilizing employment, stepped-up government spending, and a modest increase in net exports.

Construction Contracts Up

March construction contracts of $3.16 billion were up 4 pct over the year-ago level of $3.05 billion. Big gainer was heavy engineering construction at $768 million, up 12 pct over last March.

Residential building contracts came to $1.4 billion,



up 6 pct over last March. Non-residential building was down 4 pct to $1.0 billion.

But the big news is what's happening in dwelling units. These units were up 5 pct, the first such gain in 19 months. And all the gain was in apartment building. Outlook: Private housing to soon carry its load.

Price Rise Breezes Stir

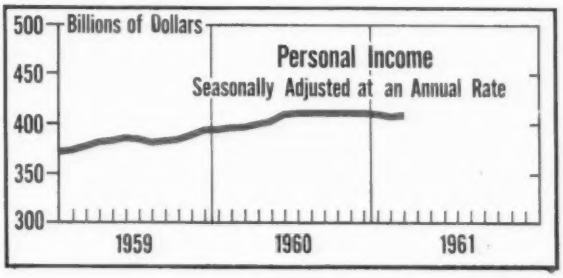
Prices of industrial materials are showing signs of inching up. Some reported signs are "shrinking discounts" and emergence of "extras."

But manufacturers should walk the price-rise stairs with caution. Here's what one top sales executive reminds: If a company working on a 15 pct gross profit margin cuts its prices 5 pct, it will need 50 pct added volume to make the same dollar profit.

Upturn Comes in Personal Income

With a boost from stepped-up GI insurance dividends, personal income rose in March. Income for the month amounted to $409.6 billion, seasonally adjusted, up from $406.2 billion in February.

The government dividends accounted for about one-



half the rise. Labor income accounted for about one-third.

Home Modernization has Promise

The Bureau of National Affairs is not one to miss Washington pulsebeats. This group says take a good look at the home modernization provisions of Pres. Kennedy's housing program.

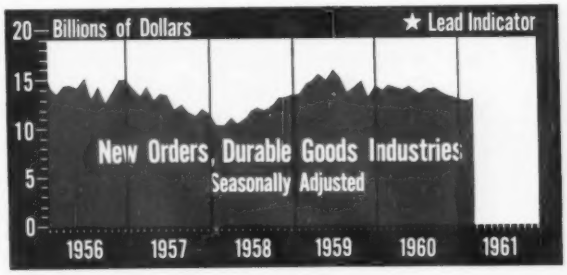
They say, as The IRON AGE has indicated, these sections of the program "may prove to be the sleeper in the entire Administration package."

There is good reason for this view. Rebuilding is already a $24 billion-a-year business—almost $5 billion spent on residential. And it's of growing interest to metalworkers.

New Strength in New Orders

New orders of durable goods manufacturers rose in March for the third straight month. Orders for the month rose to $13.5 billion, seasonally adjusted. This compares to $13.4 billion in February.

Most significantly, March was the second straight



month in which durable goods new orders exceeded sales. March durable goods sales were $13.4 billion, seasonally adjusted.

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- High standard of quietness.
- Famous Rotor simplicity of design.

Rotor Tool broadens further its line of assembly tools with RotorK. This new tool with torque-limiting clutch sets high standards for *accuracy* for jobs requiring controlled fastening. In addition to RotorK, Rotor Tool offers assembly tools with other types of clutches—direct, positive, adjustable (cushion) and impact types—to give you *the right tool for the job.*

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UAW: Chrysler Rebels Make Their Move

A rebel force of United Auto Workers at Chrysler Corp.'s Detroit Nine Mile Press Plant this week petitioned to remove the UAW as plant bargaining agent.

The petition came in response to an International officer's challenge to "clear the air and dispose of the problem." This is what Ken Morris, co-director of the UAW's East Side Region, told a Local 869 membership meeting. He noted that for many weeks the anti-UAW group had threatened to file decertification petitions with the NLRB.

Thomas Roumell, NLRB regional director, says the board will check signatures, the UAW-Chrysler contract, and NLRB rules before deciding if an election will be set.

The rebels are mainly angered by plans of Chrysler Corp. to switch stamping work from its Conant Plant in Hamtramck to the newer Nine Mile Plant. They claim job transfers will lead to the layoff of lower seniority workers at Nine Mile.

No Jobless Change In Major Labor Markets

Total number of major "areas of substantial labor surplus" remained unchanged between March and April, according to the latest Dept. of Labor survey. It stays at an all-time high of 101 out of 150.

However, the number of smaller areas with substantial unemployment rose to 199 during the period, an increase of 15 for the month.

AFL-CIO: Recession To Check Wage Gains

AFL-CIO researchers in Washington forecast the average wage increase coming out of union bargaining this year will range from 9 to 13¢ an hour.

The union researchers believe wage gains will be held down because of poor U. S. business conditions. They say most wage-benefit packages negotiated will be "moderate" in size. By "moderate" they mean about the same as those coming out of 1959 and 1960 settlements.

Missile Base Excesses Hit by Congress

Senate investigators intend to call for a crackdown on soaring wages and labor slowdowns at U. S. missile bases.

Plans for action against high wages and slowing operations at missile bases came after the Senate Investigations Subcommittee heard testimony that some electricians working at the bases are making more than the Secretary of Defense. Common laborers make more than the nation's astronauts. And some pipefitters get paid for doing nothing.

Sen. John L. McClellan (D., Ark.), chairman of the subcommittee, says the missile base labor problem is "almost revolting" and "borders almost on subversion."

Labor Harmony Needed

R. Conrad Cooper, executive vice president of personnel services for U. S. Steel Corp., told a labor relations seminar at Michigan State Univ. that steel management feels **"a great sense of urgency"** to dig into and establish a sound collective bargaining relationship with steel workers.

He said, **"our hope for more constructive collective bargaining rests on whether leaders of the Steelworkers Union will recognize their great responsibility and meet it as effectively as they have heretofore exercised their vast power."**

Mr. Cooper, chief management negotiator in the 1959-60 steel strike, said past collective bargaining has been an uneven match.

"On the union's side is the full force of organized aggressiveness. The union has enjoyed and employed legal immunity at will to close most of the country's steelmaking capacity to enforce its wage and benefit demands. On the side of companies lies only power of persuasion and ability to say no to demands which they can't accept, and to suffer the consequences."

He said union leaders too often base their strategy and propaganda on a **"fear complex."** Workers are being constantly warned that some action is anti-union and designed to destroy the union. He said it's preposterous to think management wants to break the United Steelworkers Union.

He said if collective bargaining is to work in the future, union leaders must work with management in meeting problems responsibly in light of **"the long term needs and best interest of the business, inevitably in the best interest of employees who work in steel."**

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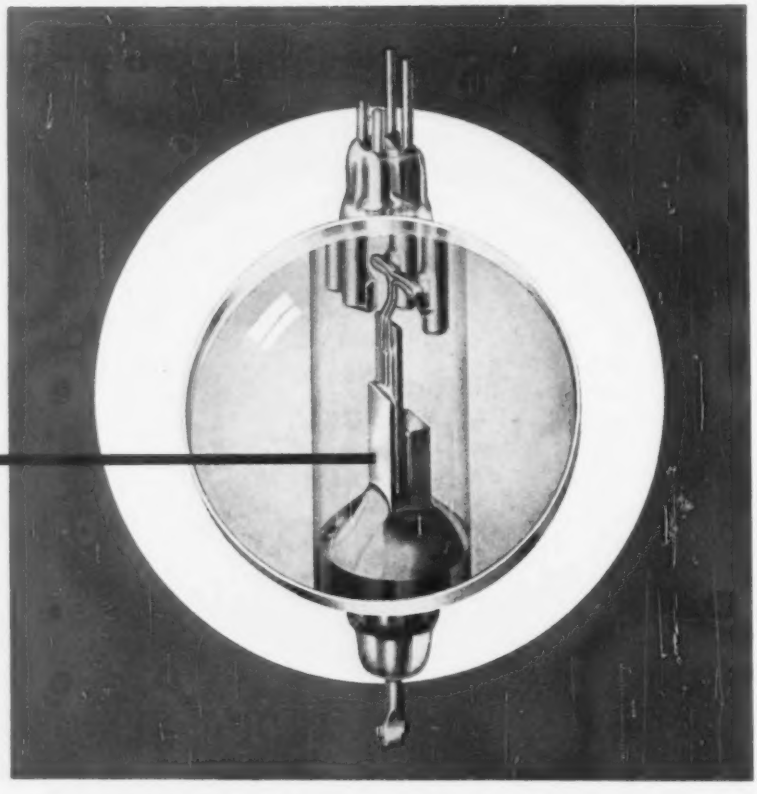

Here is another example of the extraordinary fatigue life you can get from Sandvik Spring Steel.

C. P. CLARE & CO. uses Sandvik 12W12C1 Steel as the spring support for the armature assembly in their line of Mercury-Wetted Contact Relays. Here, from a letter by Mr. C. H. Smith is what they say about it.

"The steel piece deflects through a complete cycle – once for each operation of the relay. Sandvik Steel was chosen for its excellent fatigue resistance. When you realize Clare HG relays have a life expectancy measured in billions of operations you can see the importance we place on selecting top grade materials."

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★ Identical Bids Face Probe

A company bidding for government contracts of over $10,000 will face Justice Dept. scrutiny if the bid matches that of a competitor.

President Kennedy has ordered all Federal agencies to report identical sealed bids on contracts over $10,000. Antitrust officers will check for possible price-fixing violations.

Reports will be given to the Justice Dept. on bids:

1. Which are identical as to unit price or total amount, or

2. Which, after giving effect to discounts and all other relevant factors, the Federal agencies consider to be identical.

State and local governments are invited to submit reports of identical bids, too.

Under the President's order, lists of identical bids will be made public. The order also gives the Attorney General the power to make "reasonable exemptions" from the requirements of the order.

The White House says the order "is designed to discourage the practice of identical bidding and to bring down the costs of the goods and services the government buys.

"It will also aid in the enforcement of antitrust laws, and in the maintenance of a competitive economy."

■ Congress Presses Action on Bidding

Despite Pentagon assurances that it is reviewing its contract policies, Congress still wants action to create more competitive bidding on defense contracts.

The Senate is now considering a full scale investigation of the extent to which competitive bidding is used by the military. It wants to determine, once and for all, whether existing procurement practices are "economically sound" and "consistent with the national interest."

A joint Senate-House committee is expected to make the investigation and recommend "whatever it may deem advisable."

■ Ethics Code Urged For Federal Employees

Private approaches to Federal regulatory agencies would be banned under President Kennedy's new code of ethics for Federal officials.

The President also proposes a clampdown on government employees accepting outside pay for transactions involving the government; on private property holdings of Presidential appointees; on accepting gifts from private parties; on use of non-public government information for private gain; and, on switching sides from the government to private industry in a case upon which an official has worked.

■ $300 Million Set For Depressed Areas

Federal loans of $300 million are now available for construction of industrial plants and public facilities in economically depressed areas.

Enactment of President Kennedy's $394 million depressed areas program provides $200 million to build plants—half in urban areas, half in rural areas; $100 million for communities to build such facilities as sewage systems and roads; and $94 million for later construction and technical assistance.

Under provisions of the Act, the $300 million for plants and public facilities is available immediately from the U. S. Treasury. The $94 million must be appropriated by Congress.

■ Agencies Promise Small Business Jobs

The nation's top military, space, and buying agencies promise small businessmen a bigger share of government contracts.

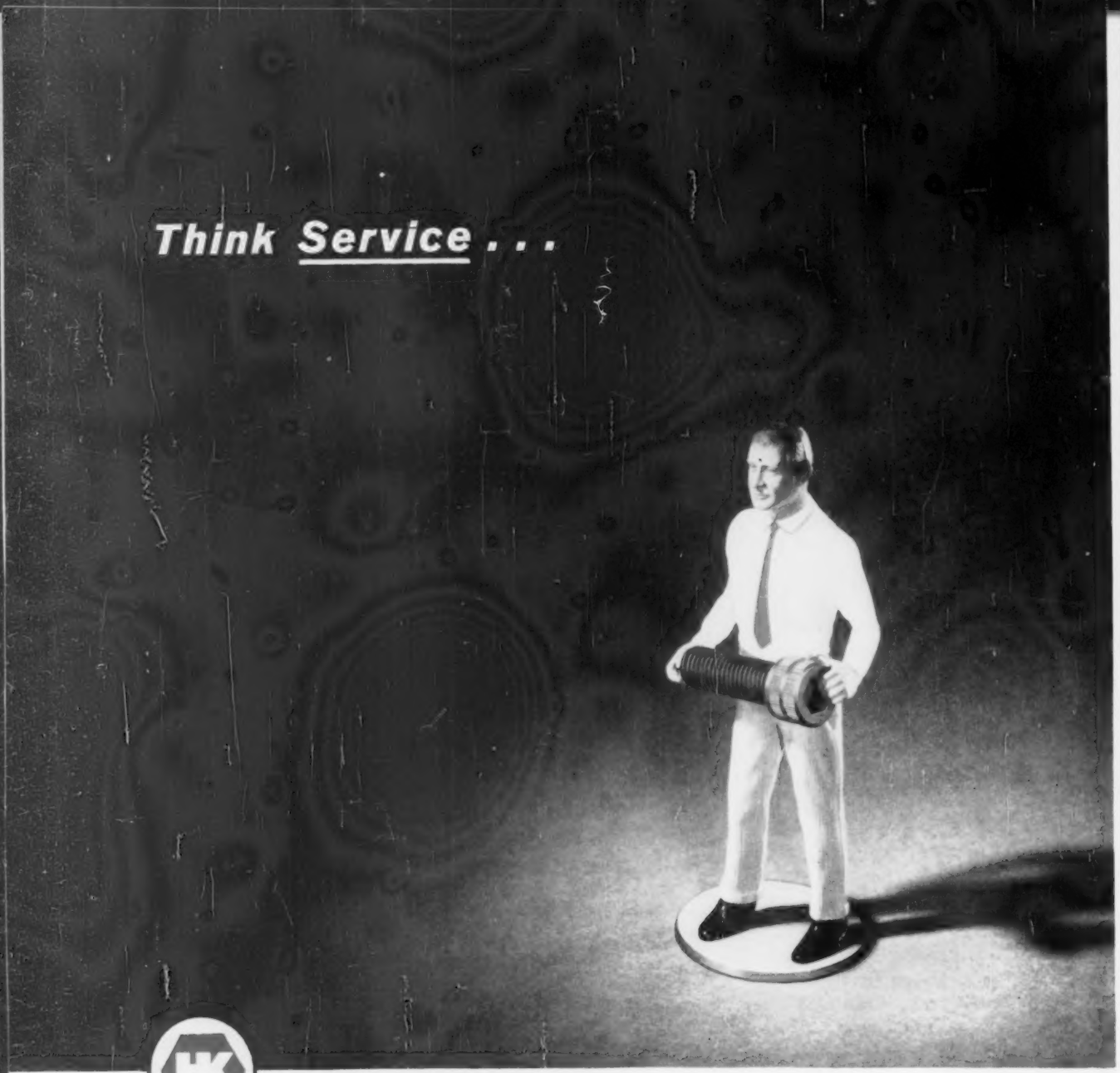
The Defense Dept. civilian space agency, and the General Services Administration made these promises before a Senate small business subcommittee:

1. Defense Secretary McNamara says his department will funnel $344 million more in defense contracts to small companies next year.

2. The Secretaries of the Army, Navy and Air Force echoed pledges to encourage award of additional contracts to small businesses.

McNAMARA: Small business.

3. And steps to give small business a bigger slice of spending were promised by James E. Webb, head of the National Aeronautics and Space Administration, and John L. Moore, head of the General Services Administration, the government's main buying agency.



HOLO-KROME REPRESENTATIVES ARE READY TO HELP YOU DESIGN AND MANUFACTURE FOR GREATER PROFIT

To take advantage of the special knowledge that's available to you, call a Holo-Krome representative. He's an expert on top-quality THERMO-FORGED* socket screws and is skilled in all phases of applying them. He'll help you design the best fastener into your product in a way that will keep manufacturing costs at a minimum.

Application assistance, same-day service and cost-reducing quality make Holo-Krome THERMO-FORGED socket screws your best fastener buy. Like full details on how Holo-Krome quality and service can help increase your profit? See your authorized Holo-Krome distributor, or write for more information.

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THE HOLO-KROME SCREW CORPORATION • HARTFORD 10, CONN.

More Control Over Exports to Europe?

U. S. exporters may find it increasingly difficult to trade with Europe. This will be due to the

DILLON: A high price.

Administration's interest in fostering European trade groups.

Treasury Secretary Douglas Dillon says the U. S. is willing to "pay the price" to foster unity in Europe between the Common Market and the European Free Trade Assn.

The "price" will be tougher European policies toward U. S. exporters. And it could be expensive. Exports to Europe, for example, were 34 pct higher in the fourth quarter of 1960 then in the same period of 1959. In terms of money, it was a gain of nearly $2 billion. At the same time, imports from Europe during that quarter were down 18 pct from 1959 levels.

Canadian Prices: Stable to Soft

While there is a distinct stability about Canadian prices at this time, there is just as distinct a downtrend in the auto prices there. According to the current monthly review of the Bank of Nova Scotia, the average net price of cars in Canada was 6 pct lower in 1960 than the year before.

Prices of electrical appliances also dropped last year. In fact, current levels are 18 pct lower than 1953 levels.

However, the Bank notes, "With business activity expected to start moving higher again in the near future, certain upward pressures on costs and prices will undoubtedly be removed.

"But in the absence of unforeseen emergencies, these pressures do not seem likely to reach anything more than modest proportions."

The Bank also says the lower exchange rate on the Canadian dollar, which might be expected to push up prices and costs, has not yet had "any substantial effect in this direction."

The area of consumer spending in which prices have been under upward pressure is services.

Export Promotion

Commerce Dept.'s export expansion program continues to move forward. Hampered by a lack of funds thus far, program officials expect new funds from Congress to fully implement their plans. Congress is considering appropriating the $17 million for export promotion plans sought by President Kennedy for next year.

XK-E Catches Customer Fancy

What a Jaguar official describes as "a completely unexpected reception by the public" has resulted in boom-sales by Jaguar standards.

The British automaker introduced the new XK-E Roadster and Coupe in the U. S. last month (see IA, April 6, p. 13). Four days after the unveiling, sales were running ahead of eight-month schedules.

Jaguar told The IRON AGE that production of the "speed-car" is just now starting in England. "It will be at least eight months before we reach maximum production." In the meantime, every XK-E to land in this country has a customer.

Reason: "It's just caught the public fancy."

U.S.-Italy Trade Continues to Grow

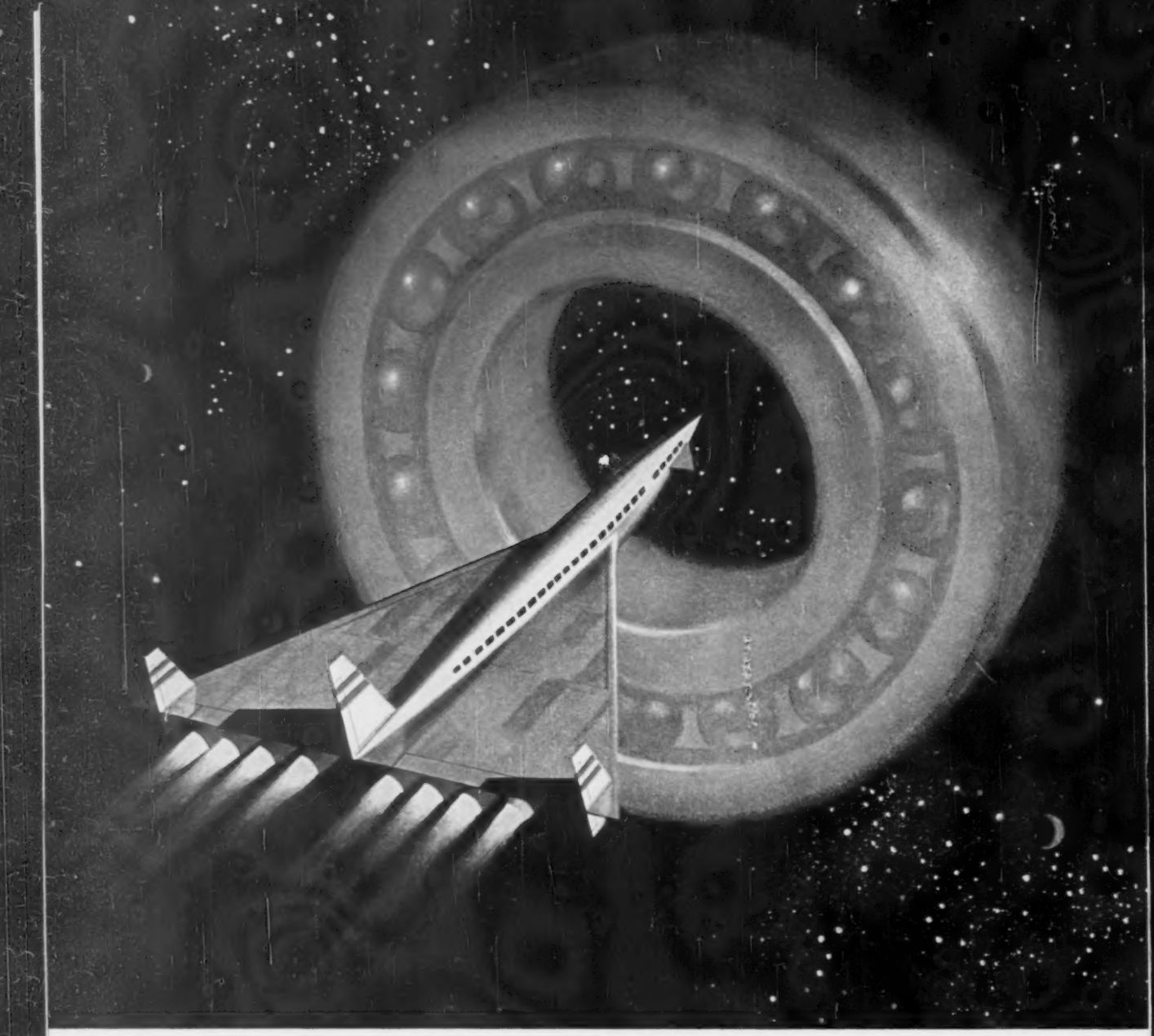
Import and export trade with Italy last year totaled nearly $1 billion. And it was a big year for the United States exporters.

According to the Italian Embassy, there was a trade balance of nearly $250 million—in favor of the U. S. This is compared with 1959's balance of $20 million.

As far as the Italians are concerned, the significant fact is that Italy now accounts for 2.7 pct of all U. S. imports. Just a few years ago,

the Italians were responsible for 2 pct of the imports here. But the U. S. gain in exports to Italy is even more significant (see chart). Italy took 3.4 pct of all U. S. exports last year.

The Italian Embassy says observers there were disturbed that Italy's best trade performance in 1960 came in the first half. Exports actually fell off in the second half.



BEARING WITH A RED HOT FUTURE

SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

On special test equipment in SKF's research laboratory, experimental ball and roller bearings are run at temperatures up to 1000° F and above—conditions under which steel becomes red hot and loses its strength, while conventional lubricants burn or boil away. To meet these problems, bearings made of special heat-resisting alloys and exotic new materials are tested and evaluated. New ideas in design and new approaches to lubrication are constantly being investigated.

Bearings to resist extremely high temperatures are needed for improved, high performance jet engines, gas turbines and other equipment. Special SKF bearings have been tested successfully in environments at about 1000° F. Under certain conditions of operation, much higher temperatures are practical.

Research like this is your assurance that SKF will always keep pace with demands for the highest possible performance in all major types of rolling contact bearings —ball, cylindrical roller, spherical roller, tapered roller and precision miniature. SKF Industries Inc., Philadelphia 32, Pa.

6103

Sound Checks Laminates

A major breakthrough in inspecting adhesive-bonded metals centers on a new ultrasonic testing method. Sonic vibrations pinpoint defective bonds in 14-layer laminated rotor blades. The high-frequency sound, transmitted at one end of each blade, is picked up by a receiver at the other end. Test results feed into a recorder. Whenever a defect is found, the recorder stops writing.

Weld Thin-Foil Metals

The problem of the missing link in the fusion welding of thin metals has been solved. This is the word from B. R. Russell, President, Airline Welding & Engineering. Mr. Russell reports: "Our roll-shear flanging machine makes it easy to get full-strength butt-fusion welds on foils."

Mold Costs Tumble

Use of furfural binders in foundry molds reduces resin costs. At least one major foundry reports that the colorless liquid binders produce stronger cores with faster cures. This foundry doesn't even bother to bake the cores. Dimensional controls are also reported to be improved over those obtained with conventional oil binders.

Special Forming Pads

Rubber pads, actuated by hydraulic pressure, offer "a vastly-improved method" for forming large metal parts. A diaphragm, mounted on the top of each pad, is filled with hydraulic oil at pressures up to 6500 psi. This causes the pad to wipe the metal against a set of form blocks. To withstand the extreme pressures, each pad must be custom-made. A dozen of these pads are now in use on large metalforming presses.

Space-Age Testing Tool

Nuclear magnetic resonance may soon become a non-destructive testing tool. Dr. T. J. Rowland, Union Carbide Corp., says that the key to predicting the behavior of useful crystalline materials lies in understanding the properties of lattice imperfections. Atomic nuclei in a magnetic field act like tiny magnets spinning about an axis. As exciting frequency varies, the behavior of these magnets defines all structural flaws.

Superconductor Alloys

Ductile alloys made of molybdenum and technetium become superconducting at temperatures near 16°K. This means their electrical resistance disappears: Any current started in a coil of one of these alloys will theoretically flow indefinitely. The newcomers retain their conductivity in magnetic fields up to 100,000 gauss. Use of these superconductors will allow a big reduction in the number of windings used on electromagnets.

Improves Diamond Tools

Low-cost grinding tools with long life result from a new method of bonding industrial diamonds to steel. The new bonds overcome troublesome surface and internal stresses. Up to 75 pct of a diamond's mass can protrude with no loss in bonding strength. Tests with these "welded-diamond" tools prove that the diamonds stay in place on continuous-grinding passes. Water spray is the only coolant needed.

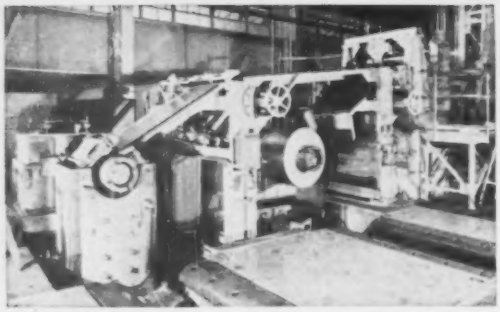
Grinding by the Numbers

Tape-controlled production grinders will soon make their bid. Along with taped programming, these units will incorporate gas bearings, lightweight design and micro-module electrical controls. They'll grind routine tolerances of five microinches. Precision will hinge on in-process gaging that supplies feed-back data to the controls.

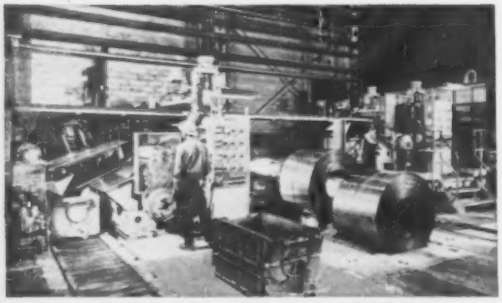
Cast-to-Shape Rotors

A semi-cold forming process yields complex cast-to-shape rotor assemblies. On production runs, stacked laminates can even be cast on rough-machined motor shafts. End rings on the as-cast rotors require no machining. This reduces finishing time. In some cases, the outside diameters must be ground. The molding medium is high-purity aluminum. End results are ultra-dense rotors that boast high conductivity, low null voltage, light mass and long life at high speeds.

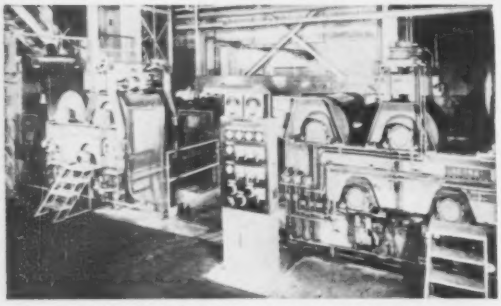
Continuous Annealing and Surface Treatment Lines have a lot in common



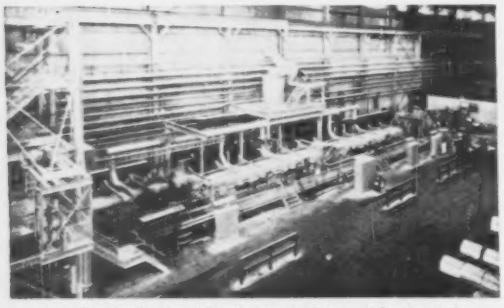
Delivery end shows recoiling.



Entry Section with uncoiling and scrap handling.



Multiple Bridle Rolls help maintain constant tension.



Strip Cleaning (horizontal) includes scrubbers and cleaning tanks.

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Aetna-Standard Division

BLAW-KNOX

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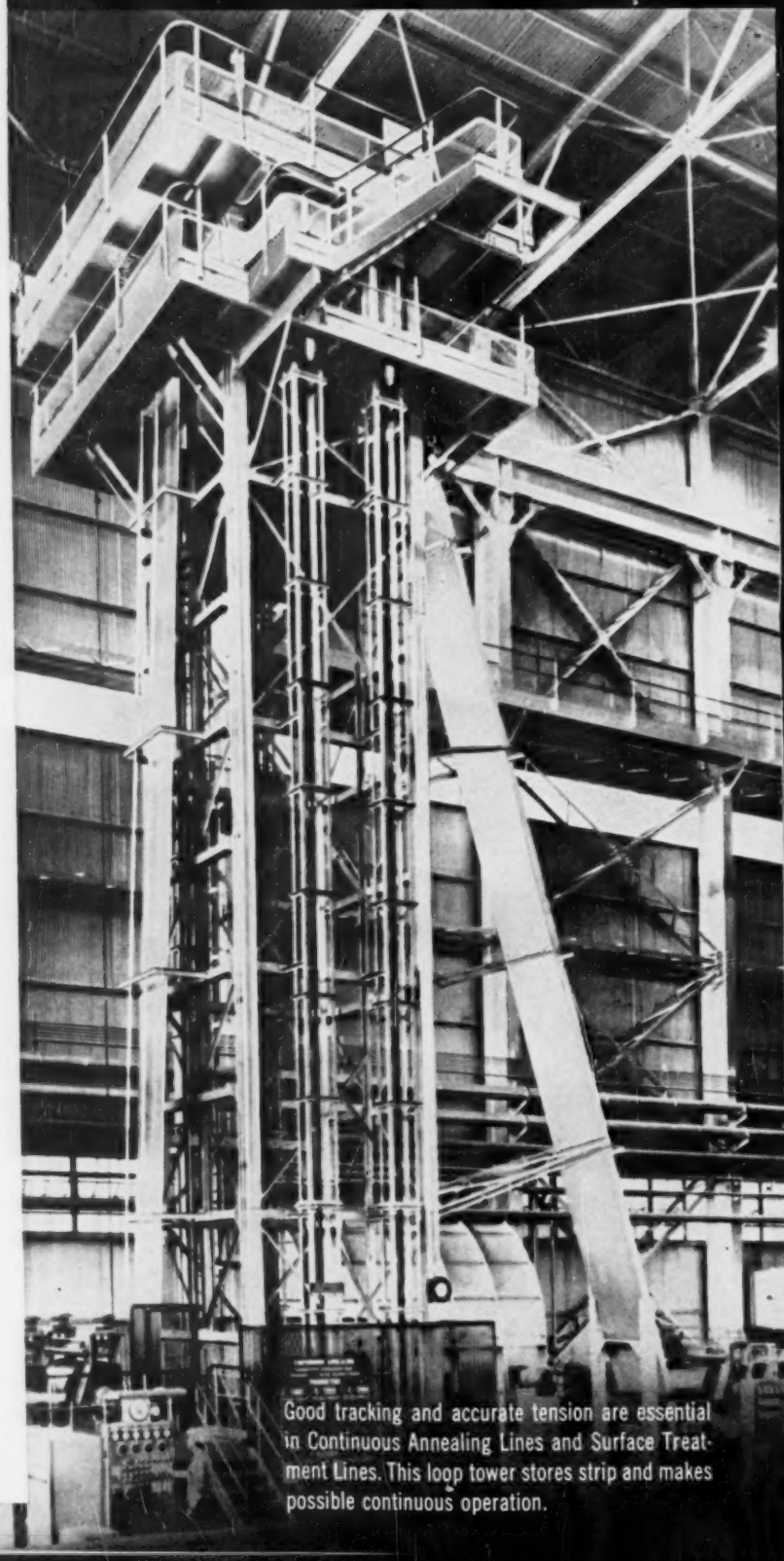
Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes Towers and Special Structures • POWER: Power Plant Specialties and Valves



Good tracking and accurate tension are essential in Continuous Annealing Lines and Surface Treatment Lines. This loop tower stores strip and makes possible continuous operation.

Congratulations

Sir—Congratulations to all the IRON AGE editors for your series on the vital issues facing management and for the interview with Robert Kennedy ("Justice Department Policies on Merger Laws," IA, April 13, p. 68). Businessmen need more of this type information and they need to be urged to do something about the information.—George C. McNutt, Oakland, Calif.

Invested Money

Sir—In reading the automotive article on p. 95 of your March 16 issue ("Ford Says Hold Labor Cost Line") I noticed your reported reaction of Carl Stellato, president, UAW Local 600, to Henry Ford's statement on holding the wage line at Ford during the coming negotiations. In your article, you noted that Mr. Stellato "obviously had looked over the company's financial statement which showed net income of $428 million in 1960 and $451 million in 1959 against 1955's record level of $454 million."

It seems to me that reporters and editors of magazines fall into an unfortunate trap when they merely compare a company's total profits in one year against a previous or record year without analyzing whether the amount of money invested, upon which profits should be earned, has at all changed during the comparable periods. For example, Mr. Stellato would not at all be impressed with an argument that Ford's total wages had increased because such total wages would, of course, depend on the number of employees on the payroll and the number of hours worked by these employees.

In your article you refer to the fact that Mr. Stellato is interested in the hourly labor cost, not total wages. Why shouldn't the same comparison be made on profits? If a company's total profits do not increase year after year as it continues to invest more money in the business, the company is in bad shape. Without knowing the facts, Ford may have a much larger sum invested in its business in 1959 and 1960 than it did in 1955 and its rate of return on the investment, I would think, must have dropped even if it reached the record levels of 1955 profits.

In all fairness to the stockholders and the managements of the corporations, I believe your articles, as well as other articles in public print, should continually keep in mind the amount of money actually invested in the business when they refer to a company's high or increasing amount of profits.—Harry Flynn, Pittsburgh, Pa.

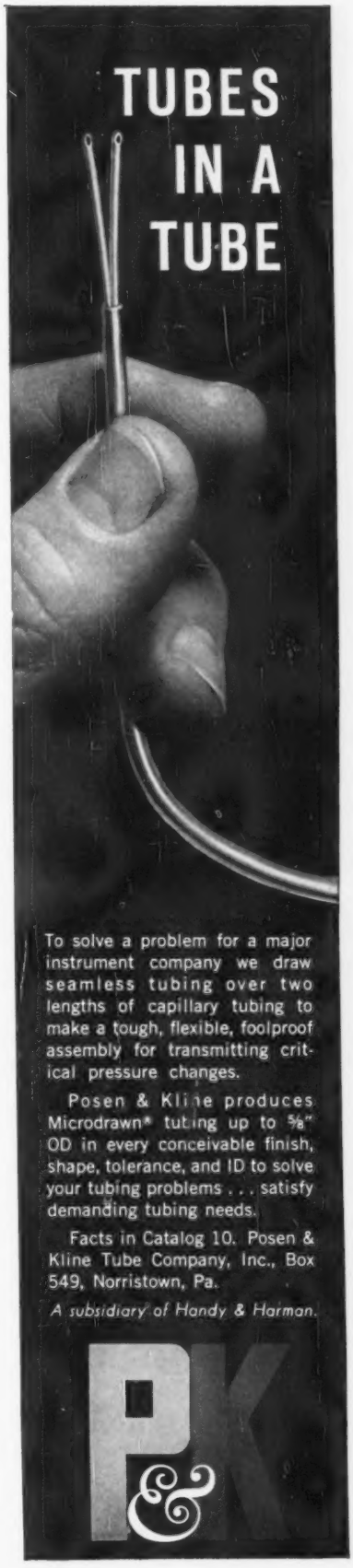
On Plating

Sir—We read the most interesting article on mechanical plating in the March 30 issue of The IRON AGE ("Mechanical Plating: A Solution to Hydrogen Embrittlement," p. 107). As a result of this article, we are planning to contact Minnesota Mining and Manufacturing Co. to find out if there is a facility in our area using this process.—L. A. Pfankuch, Shur-Lok Corp., Anaheim, Calif.

Study Seeker

Sir—In the Nov. 10, 1960, issue of The IRON AGE, you mentioned a study made by the Savage-Lewis Corp. on the effectiveness of management communication. Are copies of the full study available? It not, would you please provide us with the address of this company?—Peter C. Krist, Socony Mobil Oil Co., Inc., New York, N. Y.

■ **For a complete copy of this study write to Savage-Lewis, Inc., Communications Engineering, 1807 Lyndale Ave., S., Minneapolis, Minn. —Ed.**



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Posen & Kline produces Microdrawn* tubing up to ⅝" OD in every conceivable finish, shape, tolerance, and ID to solve your tubing problems . . . satisfy demanding tubing needs.

Facts in Catalog 10. Posen & Kline Tube Company, Inc., Box 549, Norristown, Pa.

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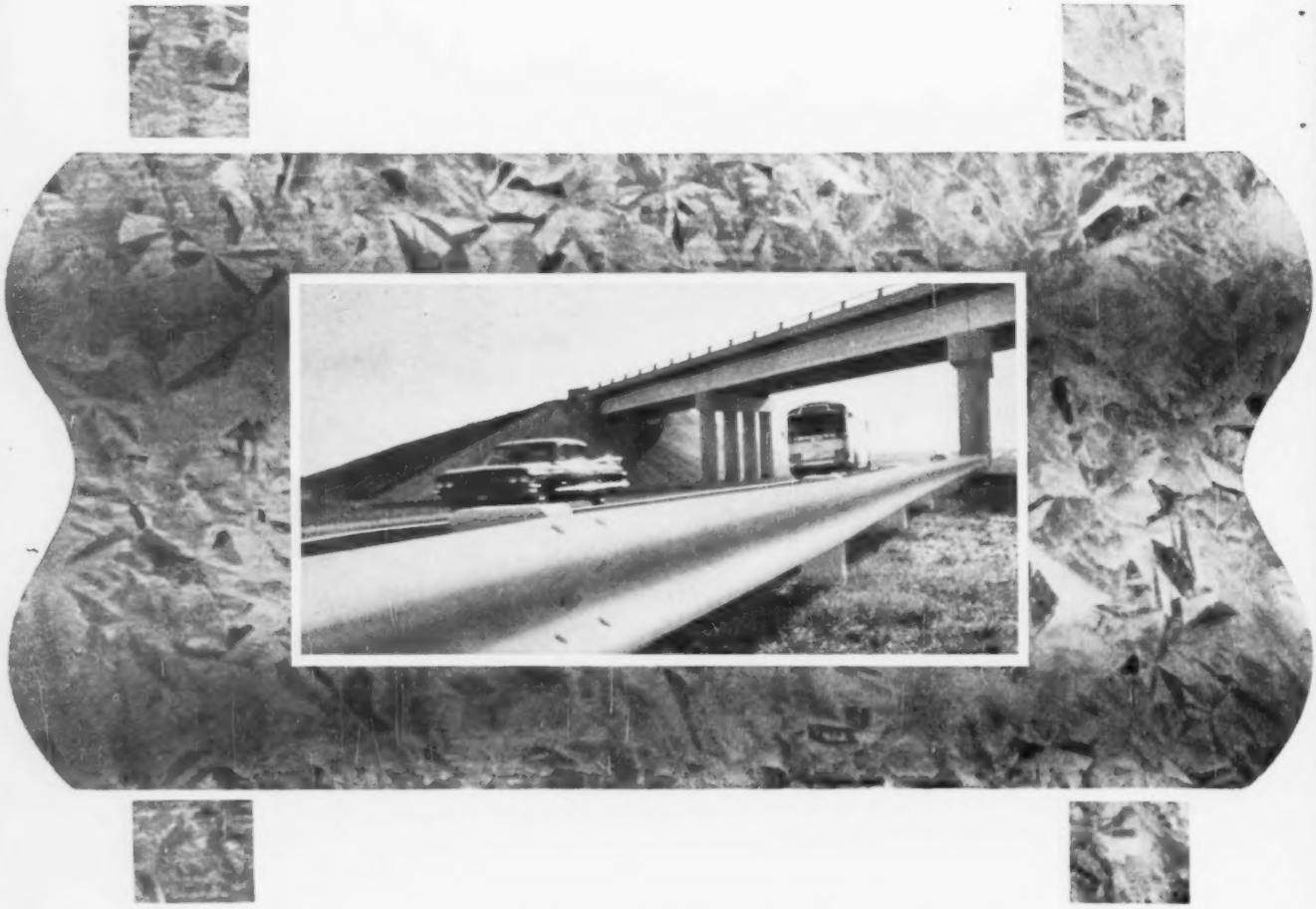
Stand-up-ability—strong reason why more and more roads are . . .



GUARDED BY GALVANIZED STEEL

Guard rails of galvanized steel are gaining favor . . . fast! Big reason: stand-up-ability . . . a neat knack of holding the line not only against impact, but also against the more gradual gnawing away that is done by time and the elements. From their inner steel core to their outer zinc coat, galvanized guard rails and median barriers stand up long and strong to deliver topmost protection with minimum cost and upkeep.

WEIRKOTE® IN PARTICULAR—You gain when you specify long-life galvanized steel for your guard rails. And you gain even more when you specify National Steel's Weirkote. To the inherent strength of steel, Weirkote adds *enduring* zinc protection. Weirkote is manufactured by two National Steel divisions, Weirton Steel and Midwest Steel. For complete details, write Weirton Steel Company, Weirton, West Virginia.

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FATIGUE CRACKS

A Vital Issue

In this issue on p. 67 you'll find the third in our series of articles on the Vital Issues facing business.

The present article is an interview with Federal Trade Commission Chairman Paul Rand Dixon. Its subject: The government's renewed drive on illegal trade practices.

What It Does—The FTC is much more than another set of governmental initials. Its role in business regulation is important.

The agency's main duties are in the fields of monopoly and unfair or deceptive trade practices. It was organized in 1915 under the Federal Trade Commission Act of 1914.

That act prohibits the use of "unfair methods of competition" and "unfair or deceptive acts or practices." Later, the FTC received duties under the Clayton Act which outlawed specific practices recognized as monopolistic.

Main Functions—Summing up, these are some of the commission's principal functions:

Protecting free and fair competition in interstate commerce in the interest of the public. This is done through prevention of price-fixing agreements, boycotts, combinations in restraint of trade, other unfair methods of competition, and unfair or deceptive practices.

Safeguarding the consuming public by preventing dissemination of false or deceptive advertisements.

Preventing discriminations in price, exclusive-dealing and tying arrangements, corporate mergers, and interlocking directories if they tend toward monopoly.

Supervising registration and operation of associations of American exporters engaged solely in export trade.

Gathering and making available to Congress, the President, and the public, factual data concerning economic and business conditions.

Preventive Action—Actually the FTC has no authority to punish; its function is to "prevent" through cease-and-desist orders and other means.

There are five members, each appointed by the President and confirmed by the Senate for a term of seven years. Not more than three of the members can be from one political party.

Correction

In the April 20 issue we incorrectly mentioned that Pittsburgh Steel Co. failed to show a profit last year. This was not the case.

To set the record straight: In 1960, Pittsburgh Steel had a net profit of $1,026,475 but a common share earnings deficit.

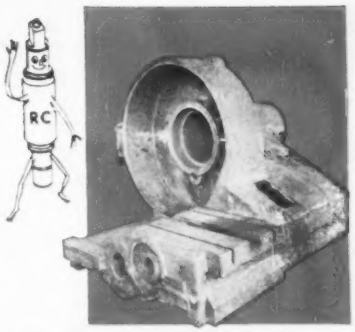
However to Pittsburgh, which came back from a $994,000 earnings deficit in 1959, our apologies.

Big Year

This seems to be a big year for anniversaries. In May, the U. S. Patent Office celebrates its 125th anniversary.

In its long history the Office has issued almost 3 million patents to help keep business and industry moving forward.

"The Post Office still rejects our non-profit application."



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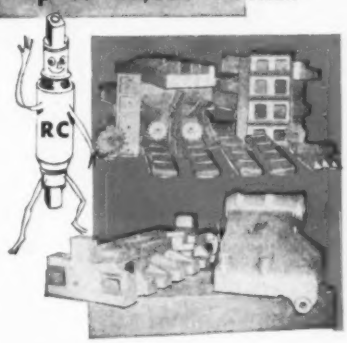

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Rolls
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Knowing both can keep your steel costs low

Steel is low in cost. If your *final* cost figure doesn't reflect that, then unnecessary, hidden expenses may be creeping into your operations. If you haven't done so, figure your costs of possession —like taxes and insurance, storing and handling. They may be adding to *your* steel costs. Often your steel service center can help you reduce them.

Each steel user's case is different. Ask your steel service center to help you determine the most economical way to buy steel. They will give you a helpful guide for figuring all your costs of possession, such as:

Cost of capital:	Cost of operation:	Other costs:
Inventory	Space	Obsolescence
Space	Material handling	Insurance
Equipment	Cutting & burning	Taxes
	Scrap & wastage	Accounting

Call your nearby steel service center, or write for free booklet, "What's Your Real Cost of Possession for Steel?"

STEEL SERVICE CENTER INSTITUTE

...YOUR STEEL SERVICE CENTER

Steel

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540-D Terminal Tower, Cleveland 13, Ohio

COMING EXHIBITS

Castings Show—May 8-12, Brooks Hall, San Francisco, Calif. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Material Handling Institute Eastern State Show—May 9-11, Trade and Convention Center, Philadelphia.

Design Engineering Show — May 22-25, Detroit Coliseum.

Tool Show—May 22-26, American Society of Tool and Manufacturing Engineers, New York Coliseum. (Society headquarters, 10700 Puritan, Detroit 38, Mich.)

MEETINGS

MAY

American Rocket Society — Oak Ridge National Laboratory, Space Nuclear Conference, May 3-5, Gatlinburg, Tenn.

National Machine Tool Builders Assn.—Spring Meeting, May 4-5, Edgewater Beach Hotel, Chicago. Assn. headquarters, 2139 Wisconsin Ave., N. W., Washington.

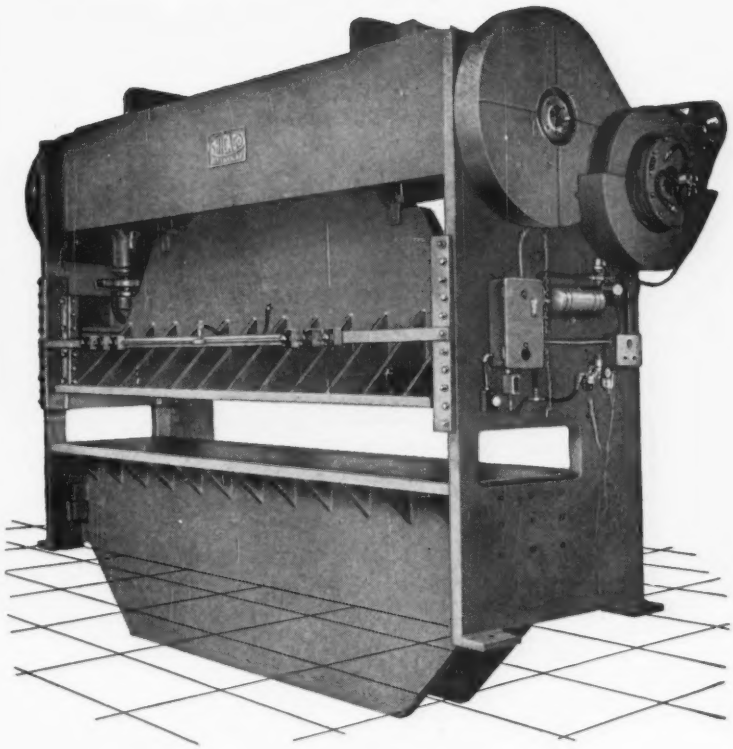
Ductile Iron Society—Annual Meeting, May 8-13, San Francisco. Society headquarters, P. O. Box 858, Cleveland.

American Foundrymen's Society—65th annual castings congress & exposition, May 8-12, Brooks Hall, Civic Auditorium, San Francisco. Society headquarters, Golf and Wolf Rds., Des Plaines, Ill.

Die Casting and Permanent Mold Div., American Foundrymen's Society—4th annual program, May 11-12, Sheraton-Palace Hotel, San Francisco.

National Assn. of Secondary Material Industries, Inc. — Atlantic Div., regional meeting, May 11, Roosevelt Hotel, New York, N. Y. Assn. Offices, 271 Madison Ave., New York 16, N. Y.

(Continued on P. 24)



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PRESSES
STRAIGHT-SIDE TYPE

large die area
capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

Complete recommendations for any job on request.

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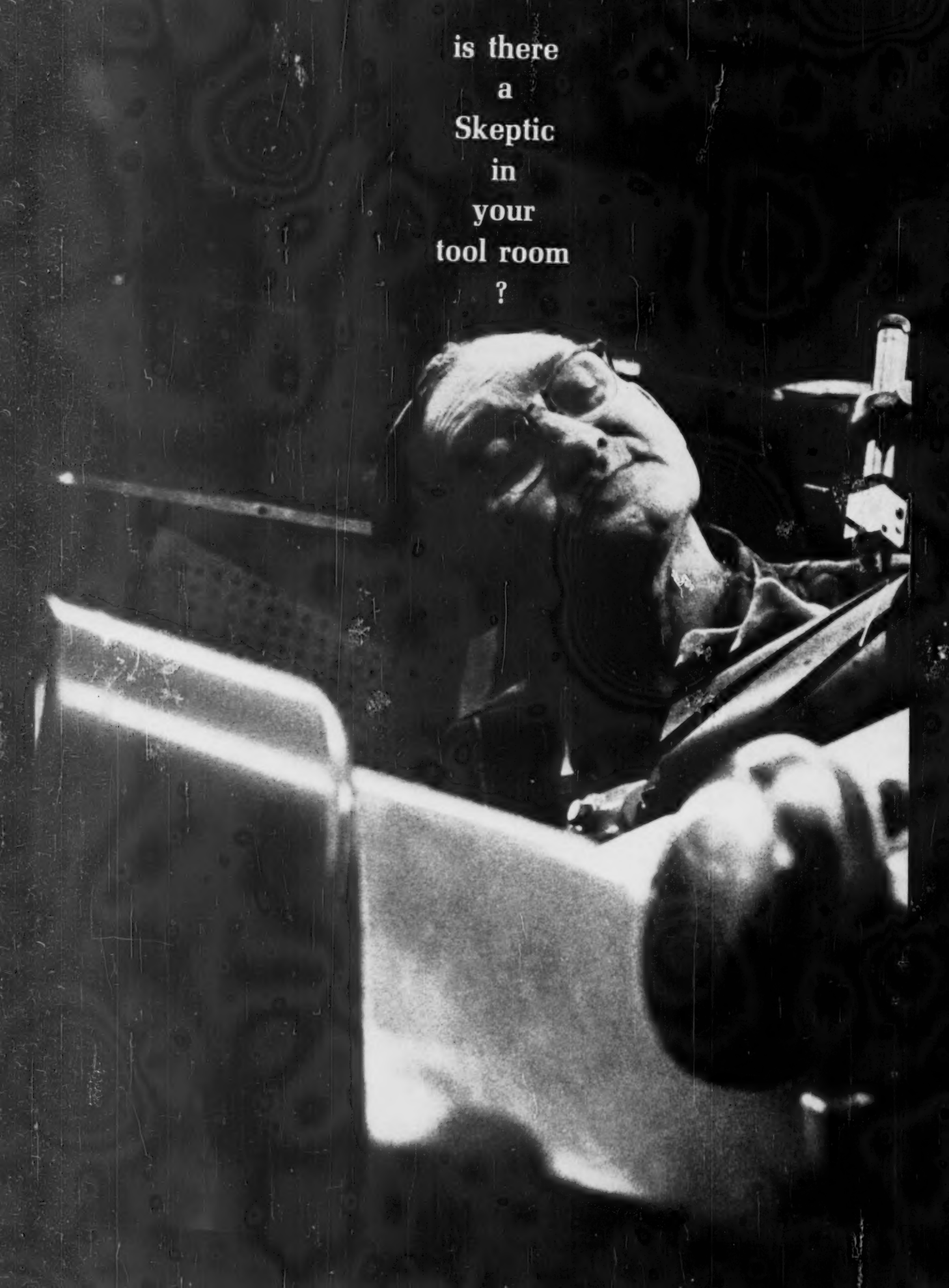
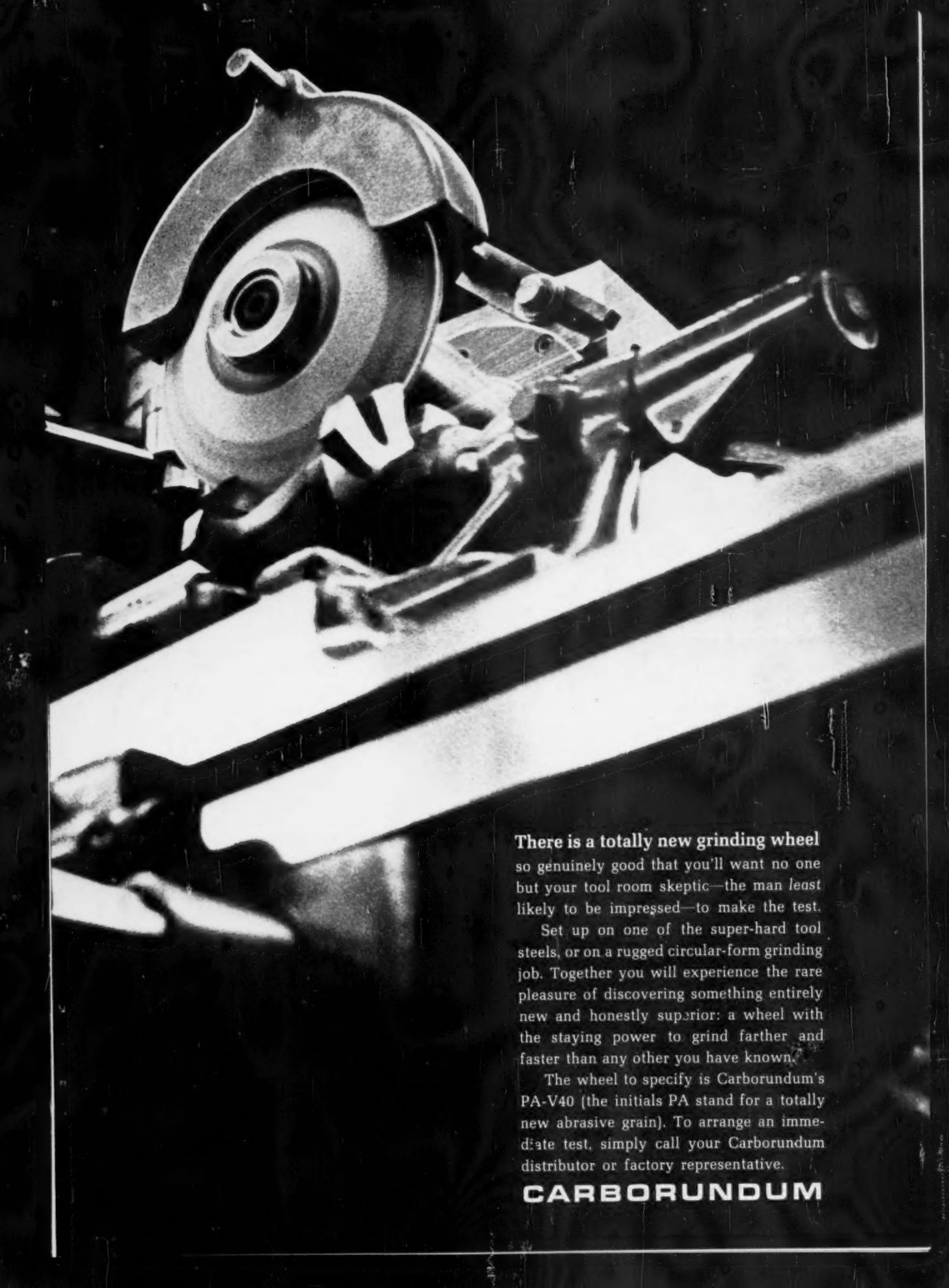

is there
a
Skeptic
in
your
tool room
?



There is a totally new grinding wheel so genuinely good that you'll want no one but your tool room skeptic—the man *least* likely to be impressed—to make the test.

Set up on one of the super-hard tool steels, or on a rugged circular-form grinding job. Together you will experience the rare pleasure of discovering something entirely new and honestly superior: a wheel with the staying power to grind farther and faster than any other you have known.

The wheel to specify is Carborundum's PA-V40 (the initials PA stand for a totally new abrasive grain). To arrange an immediate test, simply call your Carborundum distributor or factory representative.

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Force sprays into every crack, crevice and corner for permanent strength in building, repairing or waterproofing concrete construction. Effective for sandblasting, when used without sand-cement mix. Completely dependable, both in operation and results. Has wide application in Steel Industries, Foundries, Refineries, Refractories, all Construction areas.

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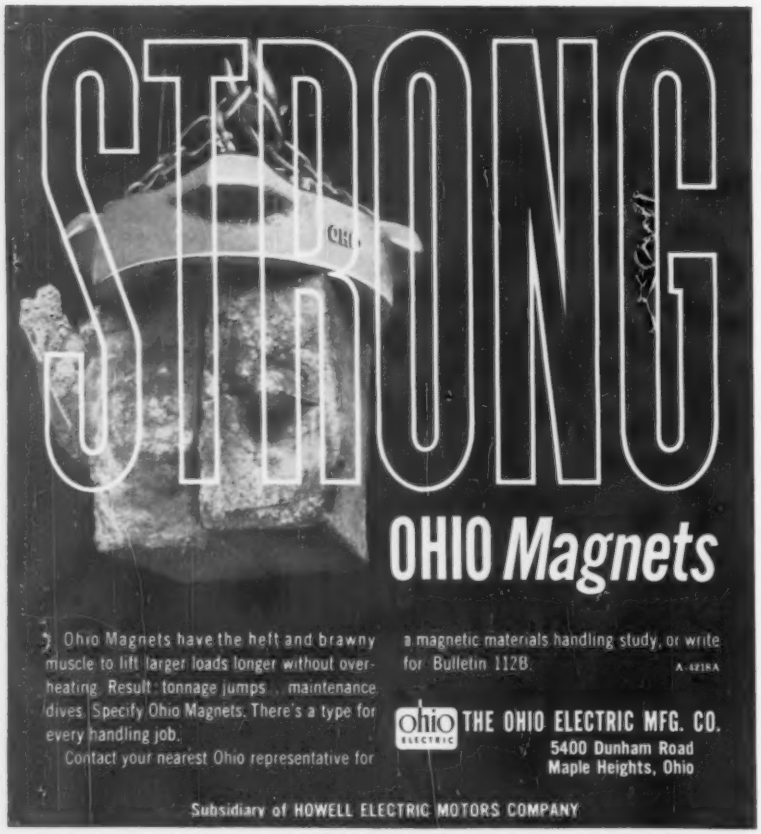

Ohio Magnets have the heft and brawny muscle to lift larger loads longer without overheating. Result: tonnage jumps . . . maintenance dives. Specify Ohio Magnets. There's a type for every handling job.

Contact your nearest Ohio representative for a magnetic materials handling study, or write for Bulletin 112B.

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Subsidiary of HOWELL ELECTRIC MOTORS COMPANY

MEETINGS

(Continued from P. 21)

Copper & Brass Research Assn.—Annual meeting, May 14-17, The Homestead, Hot Spring, Va. Assn. headquarters, 420 Lexington Ave., New York.

Steel Service Center Institute—Annual Meeting, May 14-17, Statler-Hilton Hotel, Washington, D. C. Institute headquarters, 540 Terminal Tower, Cleveland.

Machinery Dealers National Assn.—Annual Convention, May 15-18, Shoreham Hotel, Washington, D. C. Assn. headquarters, 1346 Connecticut Ave., N. W., Washington, D. C.

American Mining Congress—Coal convention & exposition, May 15-18, Cleveland. Congress headquarters, 1102 Ring Bldg., Washington.

RCA 501 Users Assn.—Study meeting, May 15-16, Palmer House, Chicago.

Building Research Institute—Spring conference, May 16-18, Shoreham Hotel, Washington. Institute headquarters, 2101 Constitution Ave., Washington 25.

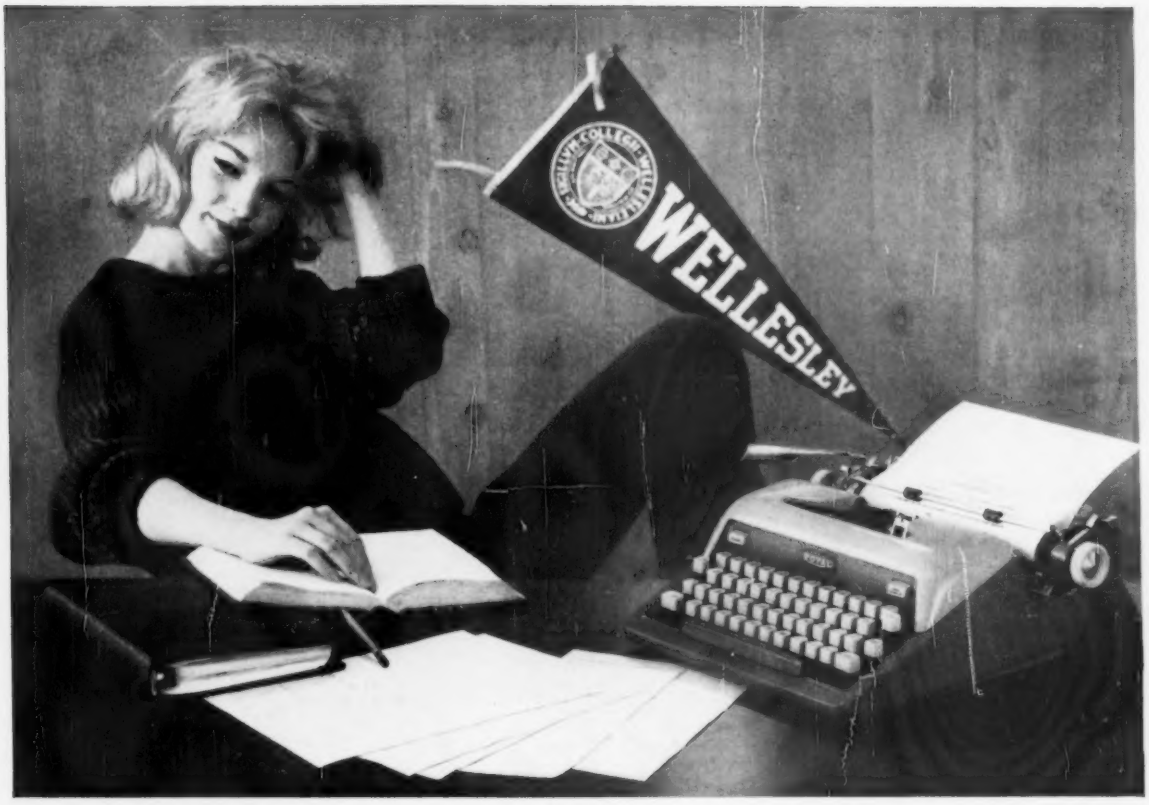
ASTME Manufacturing Engineering Conference—May 22-26, New York Coliseum. (American Society of Tool and Manufacturing Engineers, 10700 Puritan Ave., Detroit 38.)

JUNE

American Gear Manufacturers Assn.—Annual meeting, June 4-7, The Homestead, Hot Springs, Va. Assn. headquarters, One Thomas Circle, Washington.

Alloy Casting Institute — Annual meeting, June 18-20. Institute headquarters, 1001 Franklin Ave., Garden City, N. Y.

American Electroplaters' Society—48th Annual convention, June 18-23, Statler-Hilton Hotel, Boston. Society headquarters, 445 Broad St., Newark, N. J.



TAKEN FOR GRANTED

...She's concerned about the theme due next week. Never any doubt about the performance of her ROYAL PORTABLE which she "beats" on the average of 20 hours a week. Reliability's taken for granted—the greatest compliment you can pay any product.

Royal McBee Installs 2 Meaker Automatic Plating Machines to Process Over 150 Royal Portable Typewriter Parts

Much of the taken-for-granted reliability for which ROYAL PORTABLE TYPEWRITERS are famous is due to the precision plating of over 150 components done on 2 MEAKER AUTOMATIC PLATING MACHINES. One unit takes care of the entire production requirements for chrome plating — plus an equal amount of nickel plated parts. The second MEAKER plates over 100 different components in bright or "black" zinc.

Reports Mr. C. H. Farrington, Production Manager of Royal McBee's new "showplace" plant in Springfield, Mo.: "We particularly like the custom designed automatic programming on our MEAKER. We plate nickel and chrome or just nickel on one unit, and either bright or "black" zinc on the other, in any sequence desired."

Since 1899, THE MEAKER COMPANY has designed and built automatic equipment for continuous or batch-type metal finishing for large or limited production requirements. Our experience has shown that many medium size shops can pay for a MEAKER AUTOMATIC in labor savings and consistent quality production alone.

Our latest catalog "WHEN TO AUTOMATE" will give you some valuable ideas on improving your profits picture through automatic metal finishing or plating.

SINCE MEAKER 1899

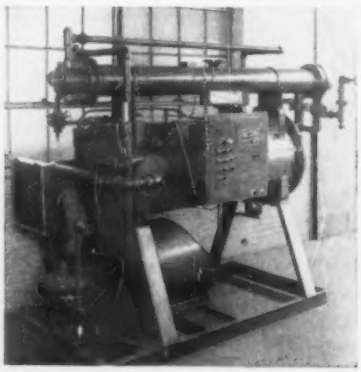
THE MEAKER COMPANY

SUBSIDIARY OF SEL-REX CORPORATION

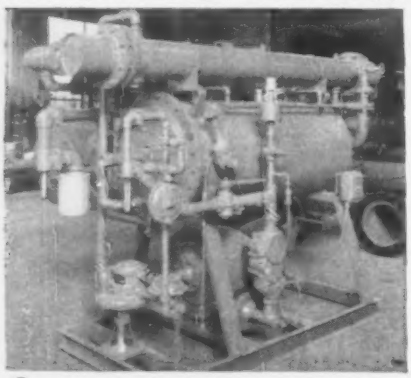
Nutley 10, New Jersey

Factories and offices Chicago 50, Ill., Los Angeles, Cal. and Nutley 10, N. J.

Which of these 3 KEMP GAS GENERATORS *do you need in your plant?*

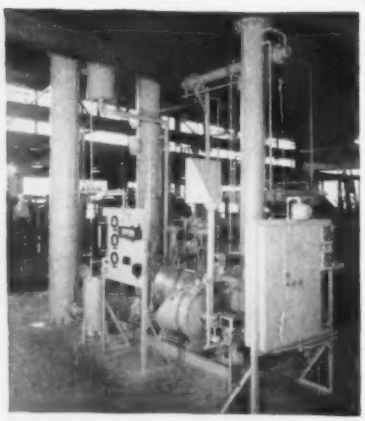


1 KEMP INERT GAS GENERATOR
—for working non-ferrous metals. Produces inert gases for use at low or high pressure, desiccated or unprocessed. Kemp gives you low-cost gas generation, completely automatic operation. Premixing in exclusive Kemp Carburetor and constant analysis assures highest thermal efficiency.



2 KEMP ATMOS GAS GENERATOR
—for working low-carbon steels. For gases low in carbon dioxide. As in all Kemp Gas Generators, test burner permits checking for proper combustion characteristics before igniting burners. Another safety feature: automatic fire-checks guard against flashback.

3 KEMP NITROGEN GENERATOR
—for working high-carbon steels. Completely eliminates CO_2 from gas, produces 99+% nitrogen. Features the easy start-up typical of all Kemp Generators. Vernier dial can be locked in position to maintain exact fuel-air ratio without further control manipulation.



The Kemp representative in your area can advise you on the type and size of generator to best solve your problem. Talk to him or write: The C. M. Kemp Manufacturing Company, 405 E. Oliver St., Baltimore 2, Maryland.

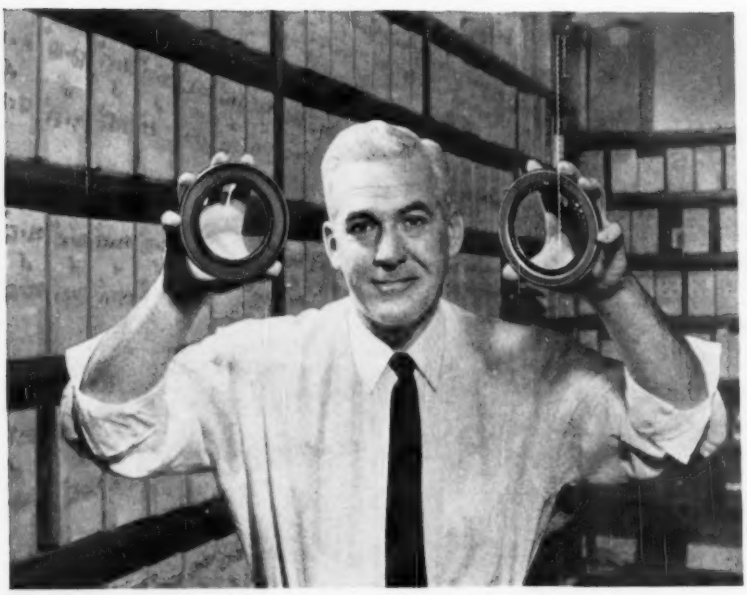
It always pays to come to

KEMP OF BALTIMORE

THE C. M. KEMP MANUFACTURING COMPANY
405 E. Oliver St., Baltimore 2, Md.

ENGINEERED OIL SEALS

from Your Local Bearing Distributor



For positive bearing protection specify high-quality Garlock KLOZURE Oil Seals from one of the listed authorized bearing distributor.

NOW—you can draw from over 1800 standard stock items of Garlock KLOZURE* Oil Seals, and enjoy "off-the-shelf" delivery from the nearest of these authorized distributors:

ALABAMA
OWEN RICHARDS CO. ..... Birmingham (4)
ARIZONA
HELMS INDUSTRIAL SUPPLY ..... Phoenix
TUCSON BEARING CO. ..... Tucson
ARKANSAS
ALLIED ARKANSAS BEARING CO. ..... Little Rock
CALIFORNIA
AMERICAN BALL & ROLLER BEARING CO. ..... Oakland
BAY CITY BEARING CO., INC. ..... Los Angeles (Maywood)
MATERSON BEARING CO. INC. ..... San Jose
RELIABLE BEARING & SUPPLY CO. ..... San Bernardino
COLORADO
BEARING SERVICE & SUPPLY CO. ..... Denver (16)
CONNECTICUT
TEK BEARING CO. ..... Stratford
FLORIDA
BALL & ROLLER BEARING CO. ..... Tampa
FLORIDA BEARINGS, INC. ..... Miami (37)
GEORGIA
BEARINGS & DRIVES OF SAVANNAH, INC. ..... Savannah
DIXIE BEARINGS, INC. ..... Atlanta
IDAHO
WESTERN BEARINGS, INC. ..... Boise
ILLINOIS
BEARING HEADQUARTERS CO DIV. OF RAY M. RING CO., INC. ..... Chicago (44)
BERRY BEARING CO. ..... Chicago (16)
GENERAL BEARINGS CO. ..... Chicago (16)
ILLINOIS BEARING CO. ..... Peoria
INDIANA
BEARING SERVICE CO. ..... South Bend
IOWA
IOWA BEARING CO. ..... Davenport
LOUISIANA
MONROE AUTOMOBILE & SUPPLY CO. ..... Monroe
MICHIGAN
DETROIT BALL BEARING CO. ..... Detroit (1)
MINNESOTA
MINNESOTA BEARING CO. ..... Minneapolis (3)
POWER SUPPLY CO. ..... Minneapolis (8)
MISSOURI
BEARING DISTRIBUTORS, INC. ..... Kansas City (10)
NEIMAN BEARINGS CO. ..... St. Louis (3)
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BEARING SUPPLY CO. ..... Billings
MONTANA HARDWARE CO. ..... Butte
NEBRASKA
PRECISION BEARING & TRANSMISSION CO. ..... Omaha (2)
NEW MEXICO
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BITCO INC. ..... Spokane
WISCONSIN
BADGER BEARING CO. ..... Milwaukee
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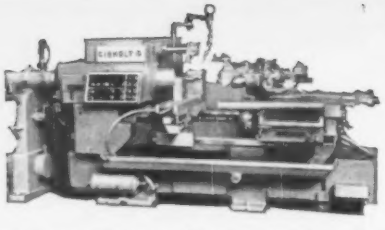
GARLOCK

These listings are headquarters only, and many of the companies have branch outlets in your area. For more information, contact the nearest of the 26 Garlock sales offices and warehouses throughout the U.S. and Canada, or write Garlock Inc., Palmyra, N.Y.

Canadian Div.: Garlock of Canada Ltd.
Plastics Div.: United States Gasket Co.
Order from the Garlock 2,000 . . . two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products

*Registered Trademark

SOMEBODY *is doing it for* LESS



GISHOLT MASTERLINE® AR TURRET LATHE

Converts for bar or chucking work in less than one hour. Sets up like a turret lathe, uses same standard tools. Cycle setting learned in a day. Offers automatic drill withdrawal for chip clearing; internal threading with solid taps; external threading with self-opening die heads; reverse feed and individually adjustable dwell; 16 spindle speeds and infinite feeds—none lost when threading.

Ask your Gisholt Representative for a desk-side demonstration, or write for Catalog 1224.

Are you keeping step with new developments in automatic machining? Many of your competitors are —and cutting costs substantially.

Even small runs—both bar and chucking work—are now going automatic.

How? With the new, fast, easy setup designed into the Gisholt AR (Automatic Ram) Turret Lathe.

Change-over time is the same as for a hand-operated machine. And—the automatic cycle cuts machining costs 25% to 40%.

To be competitive you *must* go automatic. Why wait?

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

Ask for a sample TEST BAR

of La Salle's revolutionary

fatigue-proof steel

The steel bar that has high strength WITHOUT HEAT TREATING

Yes, La Salle invites you to test a sample bar of the remarkable new FATIGUE-PROOF. This amazing new material is its own best recommendation . . . as proven by the many original equipment manufacturers who have already tested (and are using) FATIGUE-PROOF.

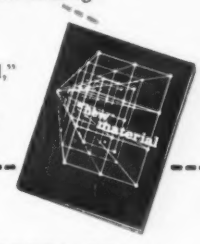
If you are making parts requiring strengths in the tensile range of 140,000 to 150,000 psi, and want to eliminate the expense or problems of heat treating . . . if you want to save production costs with a bar that machines faster (25% faster than annealed alloys—50% to 100% faster than heat treated alloys) and gives you a beautiful finish, too . . . if you want to improve the quality of your product while saving money, send us a blueprint, drop us a note giving application details, or better yet . . . pick up your telephone and call a La Salle sales engineer (REgent 4-7800, Chicago, Illinois).

MADE BY THE e.t.d. PROCESS

Elevated Temperature Drawing

FREE

Get your copy of "a new material," a 24-page booklet which gives detailed information on La Salle "FATIGUE-PROOF"® steel bars.



La Salle STEEL CO.

1436 150th STREET • HAMMOND, INDIANA

Manufacturers of America's Most Complete Line of Quality Cold-Finished Steel Bars

Please send me your "FATIGUE-PROOF" Bulletin.

Name_____

Title_____

Company_____

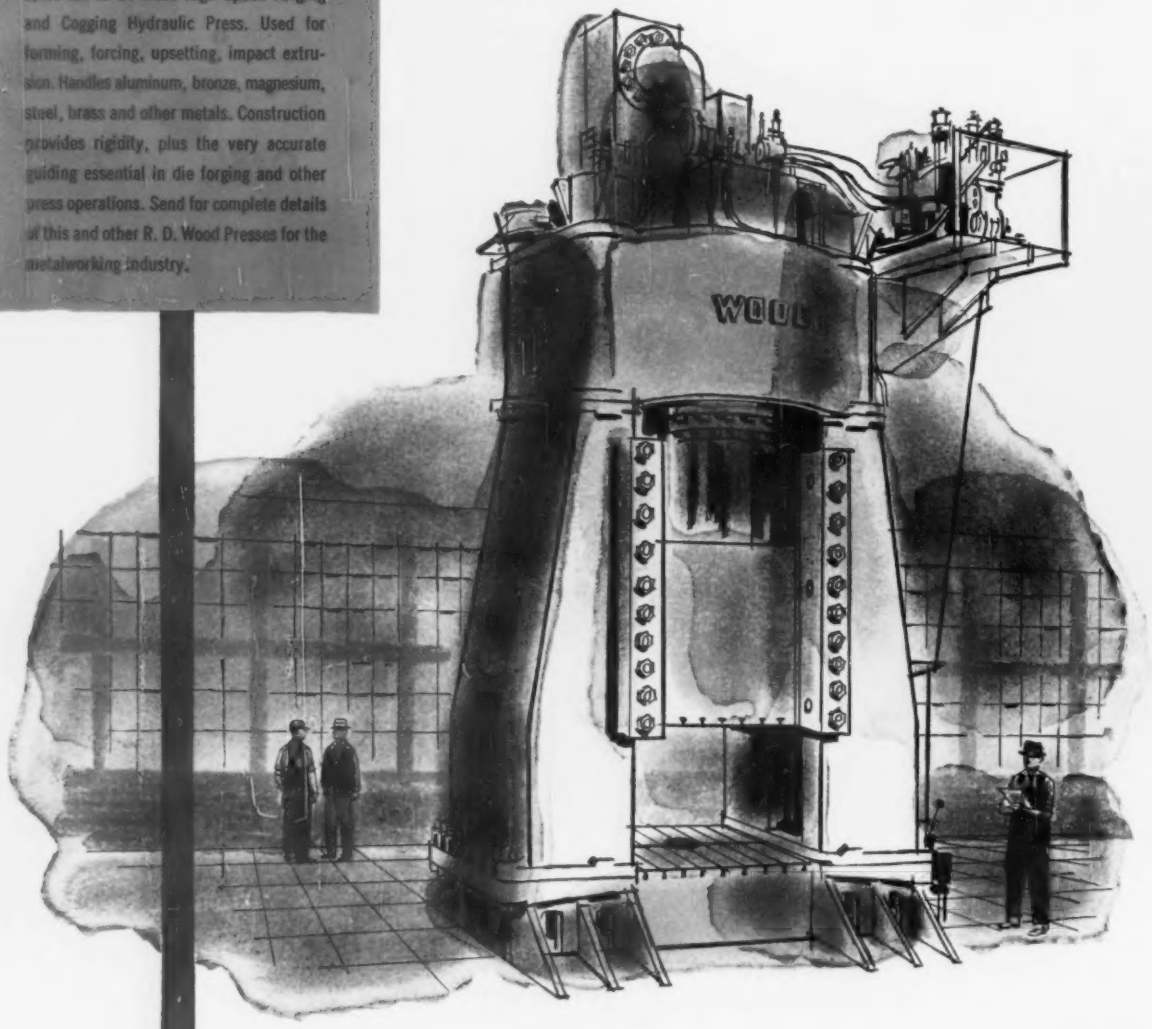
Address_____

City_____ Zone_____ State_____

3,000-ton R. D. Wood High Speed Forging and Cogging Hydraulic Press. Used for forming, forcing, upsetting, impact extrusion. Handles aluminum, bronze, magnesium, steel, brass and other metals. Construction provides rigidity, plus the very accurate guiding essential in die forging and other press operations. Send for complete details of this and other R. D. Wood Presses for the metalworking industry.

The most productive plants use R. D. Wood Presses

For proof, look at production records—and downtime for maintenance. Then watch an R. D. Wood Press at work. See for yourself the smooth, precise operation—the dependable performance—even under tough conditions. Finally, inspect an R. D. Wood Press up close. Notice the soundness of design, the excellence of materials, the scrupulous care given to each detail of construction. These are the reasons why R. D. Wood Presses have been the standard of excellence throughout the metalworking industry.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Koroseal linings installed by New England Lead Burning Company, San Leandro, Calif.

Aluminum soaks in an acid bubble bath

SUBMERGED in that tank are racks of aluminum parts being anodized. The solution is sulphuric acid—so corrosive it eats holes in steel.

For years, the only way of keeping the dangerous acid from leaking out was to line metal tanks with lead sheets. This cost a lot, yet wasn't altogether foolproof. Every so often, a "wild" electric current would punch a hole in the lead lining. The whole department waited while the repair crew plugged the leak.

Then came Koroseal, the flexible material developed by B.F.Goodrich, that can stand practically all acids. When the aluminum fabricating company opened its new plant (shown above), the new sulphuric acid tank was lined with Koroseal. That was a year and a half ago. Since then, no leaks, no repairs, no delays in production.

Today, there are scores of installations in industry where Koroseal tank linings are handling acids and chemicals that ruin other materials—and doing it better and for less money than was ever possible before. If you have a tank lining problem, it's quite likely that we have the Koroseal or rubber lining that'll solve it. Try us. For information, write *B.F.Goodrich Industrial Products Co., Dept. M-108, Akron 18, Ohio.*

Koroseal—T. M. Reg. U.S. Pat. Off.

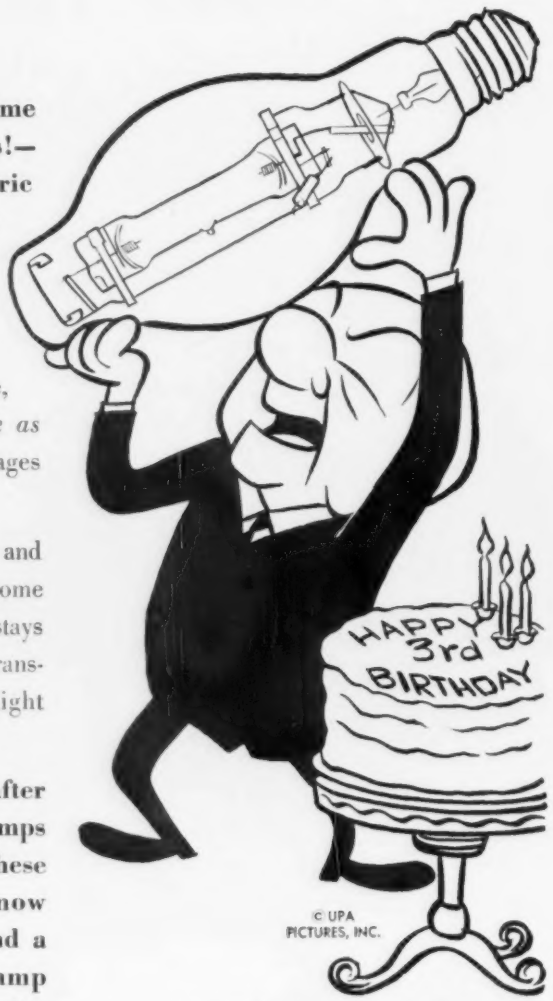
B.F.Goodrich

TANK LININGS

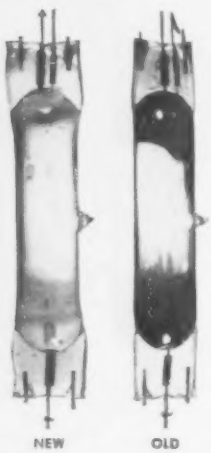
First from General Electric (1958)... another bright idea that became a better lamp for you ... Bonus Line Mercury

works 6,000 hrs. overtime and cuts your costs

Nearsighted Mister Magoo says . . . "1958? How time flies! That's the year the Nautilus—gallant lads!—went under the North Pole, and General Electric developed the Bonus Line Mercury lamp. Happy birthday, Bonus Line. Egad, who built the ship in this bottle?"



Look again, Mister Magoo. It's General Electric's special new electrode. Up through the 400-watt size, it gives you 12,000 hours of useful life—*or twice as much as the old non-bonus line.* And the higher wattages (700 and 1000) give you 50% extra useful life.



Compare these two arc tubes, and you'll see where the extra hours come from. Notice how the new one stays white instead of blackening. The translucent *white* deposit lets more light come through.

Result: you get more light after 12,000 hours than ordinary lamps produce after 6,000 hours. These extra hours are free. And now manufacturing efficiencies and a growing demand for this lamp enable us to reduce its price 15%. Other popular G-E 400-watt mercury lamps are reduced 8-13%.

Important: All G-E mercury lamps are now made only in *heat resistant glass,* to prevent glass deterioration. Ask your G-E distributor for more details. General Electric Company, Large Lamp Dept. C-19, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Cut metal cleaning costs with blasting

Pressure blasting with Norton ARROW-BLAST abrasive will save money every step of the way on most of your metal cleaning jobs — because of the high cutting efficiency and longer life of ARROW-BLAST grain. Composed of fused alumina grains that are tough, hard and sharp, ARROW-BLAST abrasive has high resistance to breakdown so that it can be used repeatedly through several cleaning operations. And unlike sandblasting, dust is negligible with ARROW-BLAST abrasive eliminating poor visibility and other hazards.

Norton NORBIDE* pressure blast nozzles add even more to the savings picture. Molded of boron carbide, the man-made material that's next to diamond in hardness, these nozzles have proven over and over that they have much lower overall operating cost than so-called "inexpensive" nozzles. NORBIDE nozzles cut costs right down the line — in replacement . . . operator downtime . . . air consumption.

An informative new report from Norton entitled "Pressure Blasting with Manufactured Abrasives," gives many details and operating facts about this efficient and economical metal cleaning process. For your copy, write NORTON COMPANY, General Offices, Worcester 6, Mass.

*Trade Marks Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

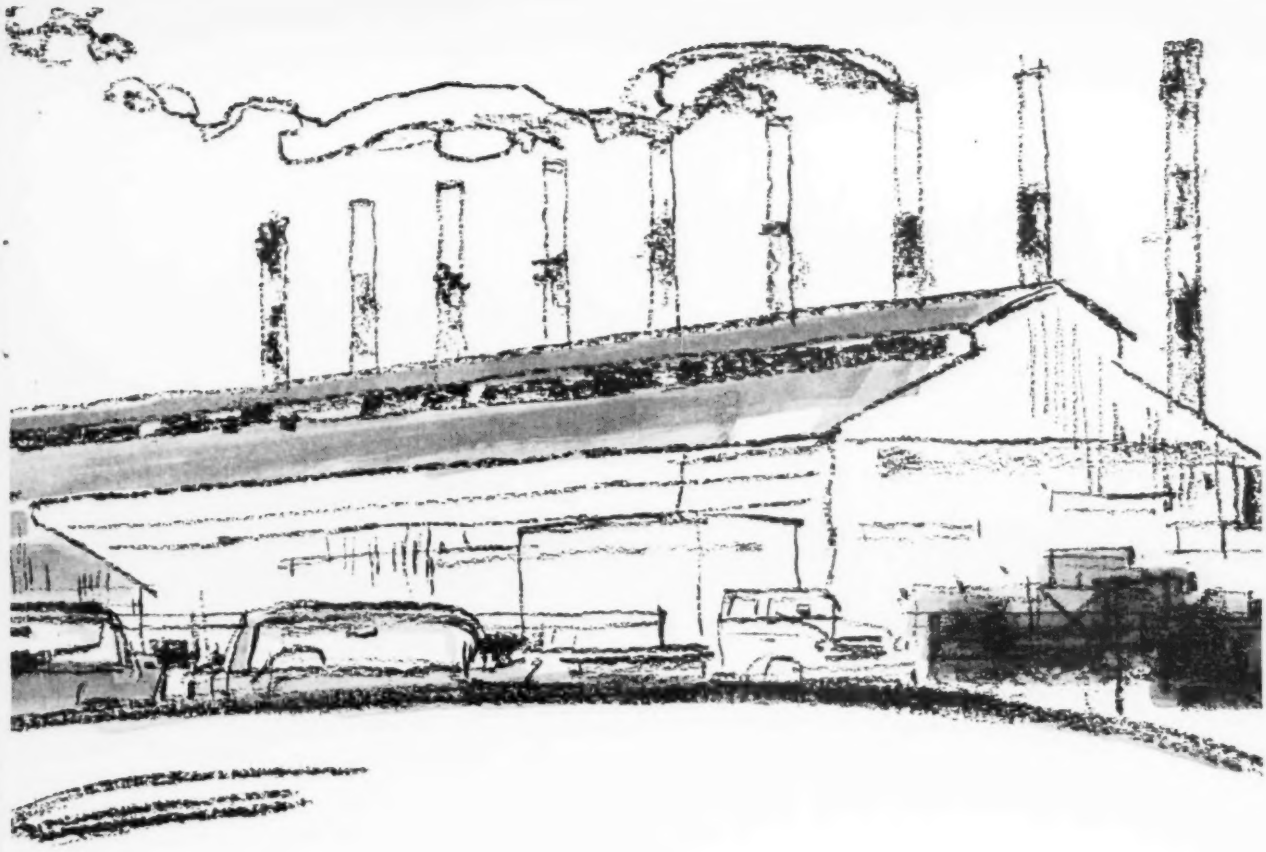
G-411

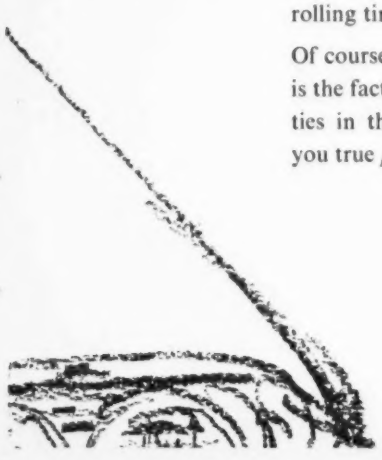
Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

"Foote says Electromanganese will reduce our breakage claims . . . and lower our processing costs at the same time!"

"I don't believe it, but let's let them prove it!"





We'd welcome the chance! Because we've seen it work for so many other steel producers. They've found that Foote Electromanganese®, 99.9% pure electrolytic manganese metal, improves ductility . . . provides finer deep-drawing qualities for *their* customers, cuts down claims and rejects.

As for lower processing costs, these same producers have slightly higher ingot costs, in some cases, but realize savings in less furnace time, less annealing time, less rolling time.

Of course, the reason behind these savings is the fact that you start with fewer impurities in the ingot. Electromanganese gives you true *pin-point control* of carbon, silicon and phosphorus—enabling you to begin and end with a superior product, and greater customer satisfaction.

Let us prove it to you! Foote metallurgists will survey your problems and processing procedures, then recommend a positive solution. If you have specific quality problems in aluminum-killed, rimming, free-machining or stainless steels, now is the perfect time to test this economical solution. Write for full information, and ask for your copy of Bulletin 201, which tells all the advantages of Foote Electromanganese. Foote Mineral Company, 438-18 West Chelten Ave., Philadelphia 44, Pa.

FOOTE
MINERAL COMPANY

This announcement is neither an offer to sell nor a solicitation of an offer to buy any of these Debentures. The offer is made only by the Prospectus.

$300,000,000

United States Steel Corporation

4½% Sinking Fund Debentures Due 1986

Dated April 15, 1961 — *Due April 15, 1986*

Interest payable April 15 and October 15 in New York City

Price 99¼% and Accrued Interest

Copies of the Prospectus may be obtained in any State from only such of the undersigned as may legally offer these Debentures in compliance with the securities laws of such State.

MORGAN STANLEY & CO.

DILLON, READ & CO. INC. — THE FIRST BOSTON CORPORATION — KUHN, LOEB & CO. Incorporated

BLYTH & CO., INC. — DREXEL & CO. — EASTMAN DILLON, UNION SECURITIES & CO.

GLORE, FORGAN & CO. — GOLDMAN, SACHS & CO. — HARRIMAN RIPLEY & CO. Incorporated

KIDDER, PEABODY & CO. — LAZARD FRERES & CO. — LEHMAN BROTHERS

MERRILL LYNCH, PIERCE, FENNER & SMITH Incorporated — SALOMON BROTHERS & HUTZLER

SMITH, BARNEY & CO. Incorporated — STONE & WEBSTER SECURITIES CORPORATION

WHITE, WELD & CO. — DEAN WITTER & CO.

April 19, 1961.

ANOTHER NORTON PRODUCT

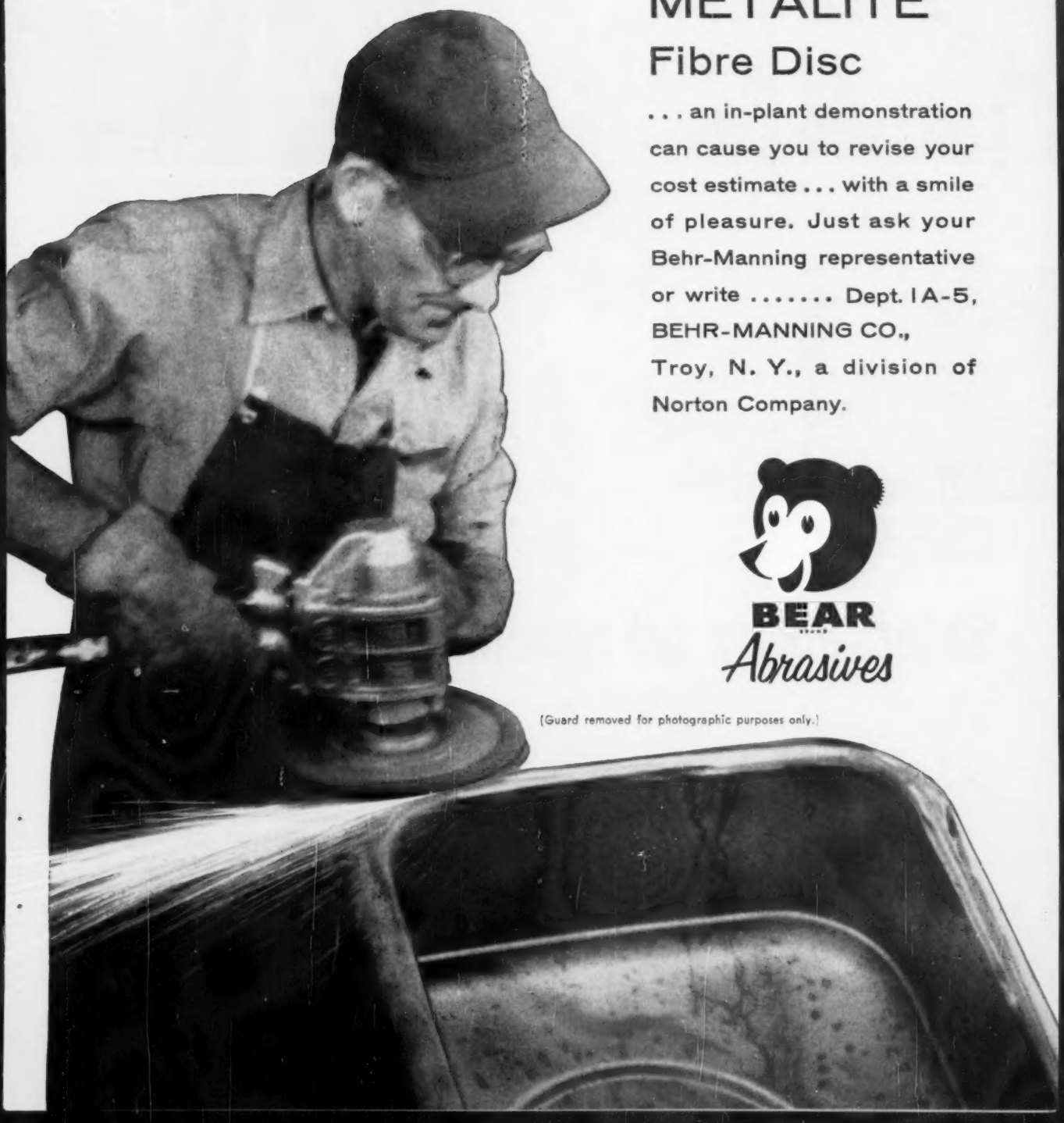
if

you haven't already discovered that profitable extra margin of grinding ability and life in a . . .

METALITE® Fibre Disc

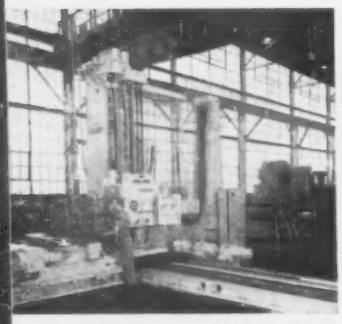
. . . an in-plant demonstration can cause you to revise your cost estimate . . . with a smile of pleasure. Just ask your Behr-Manning representative or write ..... Dept. IA-5, BEHR-MANNING CO., Troy, N. Y., a division of Norton Company.

BEAR Abrasives



(Guard removed for photographic purposes only.)

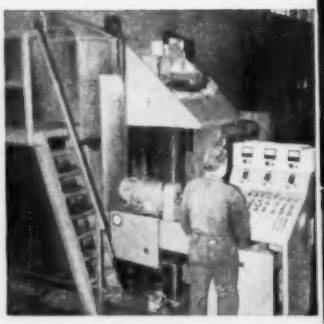
ANOTHER REASON TO SPECIFY **GENERAL ELECTRIC** NUMERICAL CONTROL



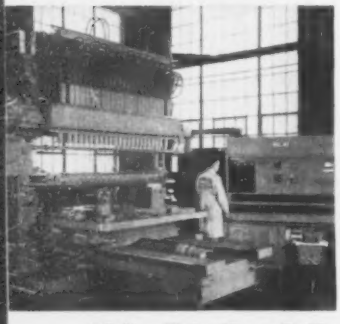
Cincinnati Gilbert Floor-type Horizontal Boring Mach., G-E Mark II NPC

Edlund Edlund-Matic (TM) Drilling and Tapping Machine, General Electric Mark II NPC

LeBlond Tape Turn Lathe, controlled by G-E Mark Century Numerical Contouring Control

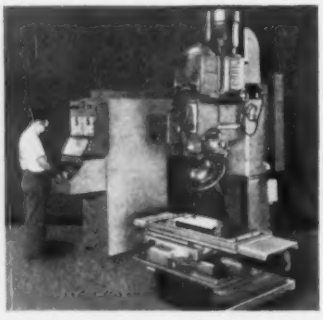


Hill Beam Drilling Machine, General Electric Mark IV NPC



Moline Tube Sheet Drilling Machine, General Electric Mark II NPC

Fosdick Fosmatic Turret Drill with Automatic Depth Control, General Electric Mark II NPC



Brown & Sharpe Turr-E-Tape Six-spindle Turret Drilling Machine, G-E Mark II NPC

Wiedemann Turret Punch Press, General Electric Mark II NPC

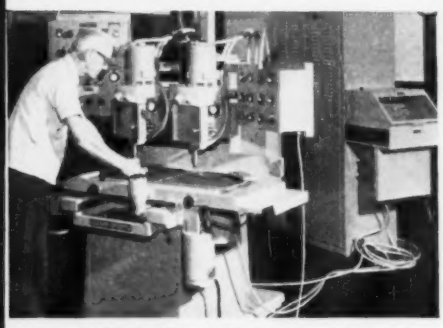
Selected by 50 machine-tool builders,

A double vote of confidence for General Electric's unmatched experience in designing, building, and applying numerical controls is evidenced by . . . the more than 50 builders who put them on the machines they sell . . . and, the over 500 American applications where they daily prove their outstanding performance on a variety of drilling, milling, punching, turning, and boring machines.

Many builders have used G-E automatic machine control since General Electric introduced electronic tracer control in 1943. Others selected G-E control based on the Company's pioneering work to develop the first magnetic tape contouring control in 1947. And many more turned to G.E. when the first building-block "packaged" positioning control—

NUMERICAL CONTROL
FOR AUTOMATION

American Tool Travelling 19-inch Column Openside Boring and Drilling Machine, General Electric Mark II NPC



Leland Gifford Two-head Printed Circuit Board Machine, General Electric Mark II Numerical Positioning Control

TODAY'S GENERAL ELECTRIC NUMERICAL CONTROL LINE features new Mark Century Numerical Positioning and Contouring Control (rear) and job-proved Mark Series Numerical Positioning Control for two to five motions (front).

proved in 500 metalworking applications

the Mark Series—was introduced in 1957. Its on-the-job record brought selection on 26 new machines exhibited at last year's Machine Tool Exposition.

And the current outlook is even brighter. New G-E Mark Century Numerical Control—utilizing solid-state circuitry—makes possible economical precision contouring with punched-tape input.

There are additional reasons to specify G-E numerical control: a full line to select from; nationwide service to minimize downtime; convenient time payment plan; and more that your machine tool builder or G-E Sales Engineer can tell you about. Or, write for descriptive bulletins to General Electric Company, Schenectady, New York. *Specialty Control Dept., Waynesboro, Virginia.* 795-13

Progress Is Our Most Important Product

GENERAL ELECTRIC

TubeXperience in action

STST*

*Superior Tool Steel Tubing

ODDS: 1000 TO 1 TO CUT COSTS, IMPROVE PERFORMANCE IN 1001 DIFFERENT APPLICATIONS

Superior tool steel tubing is an excellent material for tools, but equally good for 1001 other applications. Odds are that it will cut costs and improve performance wherever it is used. Type E-52100, an oil hardening grade of high-carbon and chromium alloy steel, has been widely used for such diverse applications as thread guides on hosiery knitting machines, nylon yarn guides, ball bearing races, nozzles for blast cleaning equipment, gear and pinion parts, dental instruments and extrusion mandrels. Type E-1095, a high-carbon steel tubing, is serving as applicators for jewelers' oilers, leather and paper punches, and surgical instruments.

Perhaps you have an application that can benefit from high strength and hardness, good wear resistance, abrasion resistance, shock resistance, and notch toughness. In that case, consider Superior tool steel tubing before you go any farther. It could give you a better product at a lower cost. Send for Data Memorandum #14, a handy guide to your thinking. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

Steel

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The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

2 B&D Magnetic Drill Presses drill 1 hole every 29 seconds for 14 days!

Without letup (or breakdown), making over 42,300 holes 15/16" diameter in heavy steel plates . . . two Black & Decker Magnetic Drill Presses (3/4" and 1 1/4" sizes) drilled around-the-clock for 14 days to meet an extraordinary deadline. The job resulted from a special rush order given Southern Reinforcing Steel Company for prestressed concrete requiring 2 large jigs. The need was for a tool with drill press accuracy, portable drill versatility and time-proved durability. That's why the choice was the Black & Decker Magnetic Drill Press.

Over 1,500 pounds of magnetic power hold this drill in position . . . up, down *or* sideways. Famous B&D power makes any job quicker and easier. The Black & Decker Magnetic Drill Press is sold by leading distributors everywhere. *For sales and service, look in the Yellow Pages under*

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Black & Decker®

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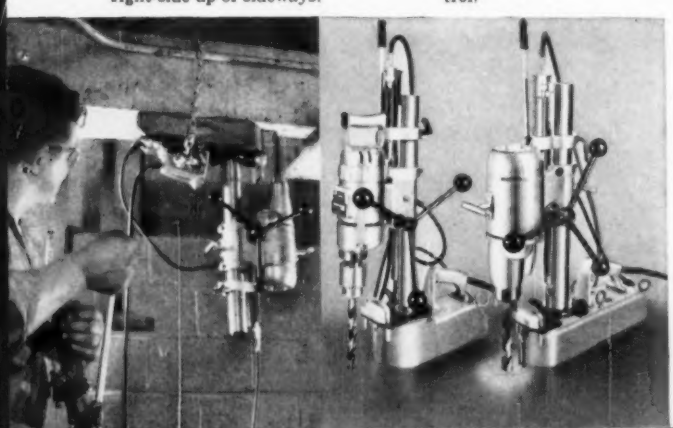
Remote Hydra-Power Feed is available on all three B&D Magnetic Drill Presses. You just stand aside and let these tools do the work — upside down, right-side up or sideways.

Single-speed 1/4" and 1 1/4" sizes, and two-speed 1 1/4" model give you a three-way choice of B&D Magnetic Drill Presses. All operate manually or by remote control.



THE BLACK & DECKER MFG. CO., Dept. 0905
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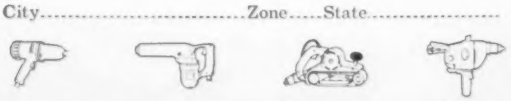

☐ Impact Wrenches ☐ Hammers ☐ Belt Sanders ☐ Drills

SCIAKY ELECTRON BEAM WELDING

Here's how you can combine precision research and practical production electron beam welding in one equipment installation

Whether your interest in electron beam welding processes is for highly precise research or practical production work—or both—your data should be complete with details on Sciaky machines. They are most simple and practical in concept and operation.

GUN DESIGN GIVES EXCEPTIONAL ELECTRON OPTICS

The Sciaky Electron Gun produces specific beam density previously possible only with accelerating potential higher than 100,000 volts. The Sciaky gun, entirely contained within the atmosphere of the welding chamber, will operate in any angular position. *Both* gun and fixture can be moved to any position within the chamber while welding.

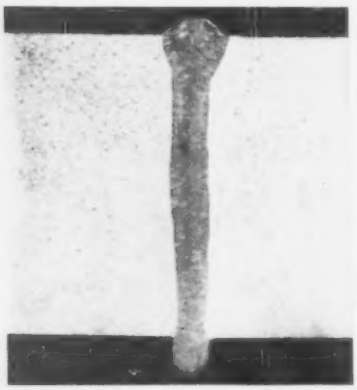

Figure 1

Advanced focusing design results in electron beam welds of 12 to 1 depth to width characteristics. Figure 1 shows a deep penetrating butt weld in type 304 stainless steel. Plate thickness is .5". Note lack of heat-affected zone.

GUN AN INDUSTRIAL TOOL

The gun construction is simple and rugged. Precise alignment is inherent in design, and is not dependent upon assembly adjustments. If necessary, filaments can be easily and quickly replaced in less than five minutes. As shown in Figure 2, the Sciaky Electron Beam Gun is small and

Figure 2

compact. A simple spacer arrangement optimizes gun optical system throughout a wide range of output power without compromise of specific beam energy. As a result, the

Figure 3

Sciaky gun is optimized at current ranges of 250, 150, 100 and 50 MA. at 30,000 volts. Output power is continuously adjustable within each range.

EFFICIENT PUMPING SYSTEM

Evacuation of chamber to welding pressure is obtained within 3 to 10 minutes, depending on chamber size. Pumping sequence is fully automatic, and without any manual adjustment. Automatic safety devices insure trouble-free operation and full protection of system.

RADIOLOGICAL HAZARDS ELIMINATED

Low voltage (30,000 v. maximum) and highly refined chamber design eliminate x-ray hazards to operator, which are a severe problem with higher voltage equipment. As a result, the Sciaky low voltage system needs no costly shielding, even when welding at highest output.

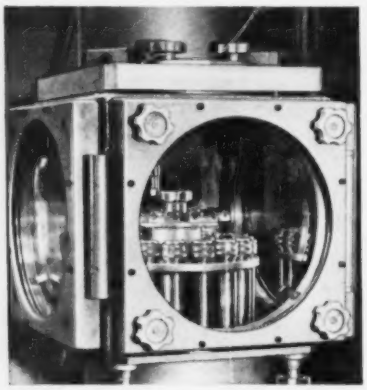

Figure 4

As shown in Figures 3 and 4, complete accessibility and visibility are provided by this latest Sciaky design. All sequence controls of the dial feed unit (Figure 4) are fully automatic. This production unit is being used to weld end-caps to tubes.

Regardless of your specific area of interest, you'll find the Sciaky combination of welding experience and electron beam technology is well advanced. Sciaky is Exclusive Licensee under Stohr, U.S. Patent 2,932,720.

81C8102

Please write for information — without obligation, of course!

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how Parish ingenuity reduced a forming operation to 1/1,000 of a second!

Operator removing an outer warhead shell formed and shaped by explosives.

problem: How to reduce the time and cost involved in forming large aluminum alloy missile warheads.

solution: Parish research engineers reduced the forming rate of aluminum inner and outer warhead shells to 1/1,000th of a second with explosives. A split die equipped with vacuum seals and an open top was used, with water serving as a transmitting medium for the Primacord explosive. Parish ingenuity dramatically reduced forming rates while keeping springback and work hardening to a minimum.

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Write for your copy of this illustrated booklet describing the diversified facilities available to you at Parish.

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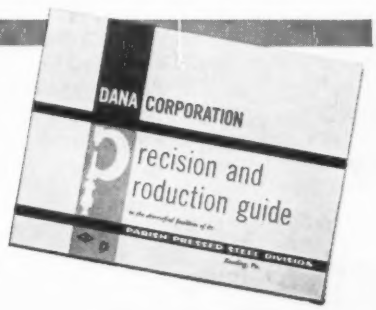
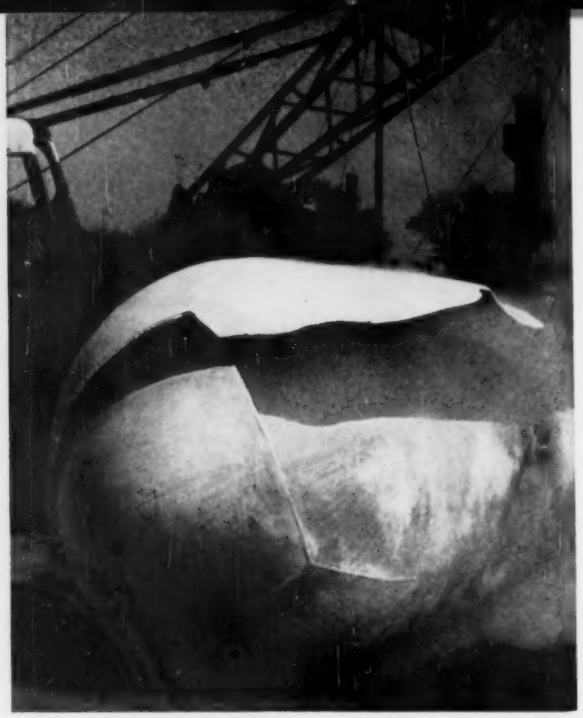
DIVISION OF DANA CORPORATION • READING, PENNSYLVANIA



Burst-test for cylindrical-pressure vessels fabricated from USS 9% Nickel Steel, cooled to −320°F, then pressurized to bursting. This one was quenched and tempered—not stress relieved.



Same vessel after bursting at a pressure of 2,160 psi—almost 6 times the design pressure of 370 psi.

Operation Cryogenics—Success story of USS

Destruction tests on welded tanks holding liquid nitrogen prove that vessels made from quenched and tempered or double normalized and tempered 9% Nickel Steel, *without* post-fabrication stress relieving, equal—and often exceed—the performance of vessels made of the same steel, which are stress relieved after fabrication.

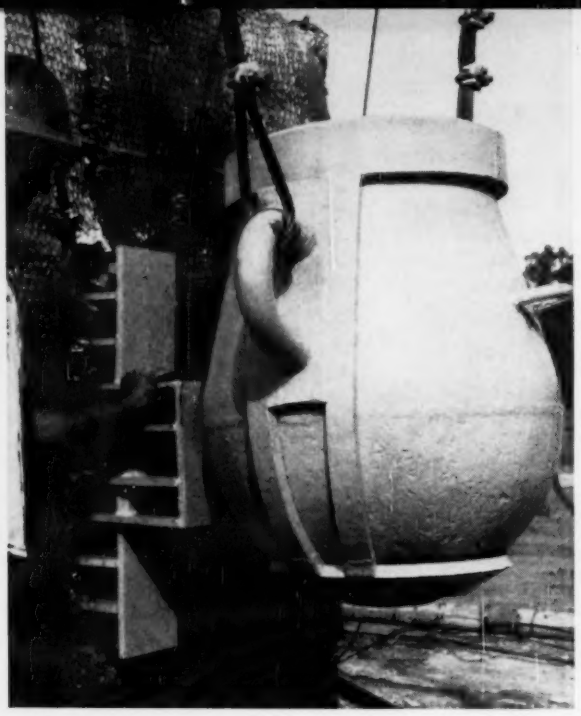
Recently, a series of impact and burst tests, known as "Operation Cryogenics," were performed on 9% Nickel Steel pressure vessels at the Fairless Works of United States Steel. The science of cryogenics, involving the development and practical utilization of materials in extremely low-temperature service, has assumed major importance in industry and in national defense. Much preliminary and advanced development work has been done cooperatively by The International Nickel Company, Inc., The Chicago Bridge & Iron Company, and United States Steel Corporation.

Objectives of "Operation Cryogenics" were to demonstrate (1) the suitability of 9% Nickel Steel, quenched and tempered or double normalized and tempered, in the as-welded condition (not stress relieved), for very low-temperature use; (2) the excellent properties of quenched and tempered 9% Nickel Steel; (3) the ductile behavior of 9% Nickel Steel in the as-welded condition during enforced failure at very low temperature; (4) the behavior of 9% Nickel Steel in the stress-relieved condition for very low-temperature use.

Test conditions: Two basic types of vessels were tested—rectangular vessels 8 feet square and 6 feet high simulating a type that might be used for shipboard transportation of liquefied gases, and cylindrical vessels 4 feet in diameter and 13 feet long with hemispherical heads such as are used for land-based storage and transportation of liquefied gases. All vessels were welded from economical 9% Nickel Steel plate $\frac{3}{8}$" thick, from the same heat of steel.

A total of nine vessels was built for the test. Five were made from 9% Nickel Steel plates and forgings in the quenched and tempered condition (QT) and four in the double normalized and tempered condition (NNT). Further, six of the vessels were tested as welded (AW), without any heat treatment after fabrication. Three were stress relieved (SR).

Impact test results. Impact testing of the three rectangular vessels, refrigerated with liquid nitrogen to −320°F, illustrated that 9% Nickel Steel vessels are capable of undergoing extensive plastic deformation even at extremely low temperatures. The vessels were repeatedly impacted both under pressure and without pressure by blows exceeding 80,000 foot-pounds. One quenched and tempered vessel did not fail, despite 7 impacts. Results clearly indicated the ability of quenched and tempered 9% Nickel Steel vessels in the as-welded condition (not stress relieved) to withstand impacts far beyond any which are likely to occur in service.



4340-pound wrecking ball used in striking rectangular vessels from varying heights.

Impact Test—Rectangular vessel of 9% Nickel Steel quenched and tempered but not stress relieved, refrigerated to —320°F. Withstood severe impact of 82,460 foot-pounds and did not fracture, proving superior strength and toughness of the steel.

9% Nickel Steel Tanks punished at -320°F.

Burst test results. The cylindrical vessels were designed for 370 psi internal pressure (hoop stress in shell equal to 23,750 psi). These vessels were refrigerated to -320°F with liquid nitrogen and pressurized to failure. *The burst pressure for all vessels was at least four times the design pressure of 370 psi and one of the non stress-relieved vessels didn't burst until 2,300 psi.* (See Table I)

These tests prove that USS 9% Nickel Steel has the high strength, toughness, and weldability needed for low-temperature pressure vessels.

We urge you to consider USS 9% Nickel Steel for economical low-temperature vessels. For the complete story, write to United States Steel, Room 6210, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

BURST TESTS 9% NICKEL STEEL CYLINDRICAL VESSELS

	PC-1	PC-2	PC-3	PC-4	C-5	PC-6
Heat Treatment	QT	NNT	QT	NNT	QT	NNT
Test Condition	AW	SR	SR	AW	AW	SR
Temp of Vessel (°F) at start of test	—308	—320	—320	—320	—320	—322
Temp. of Vessel at Failure (°F)	—304	—320	—311	—310	—302	—314
Burst pressure (psi)	2,275	1,550	2,125	2,300	2,160	2,100
Burst stress (psi)	135,510	92,920	129,800	135,730	132,500	129,100

TABLE I. Complete data are shown for burst testing of the cylindrical vessels. In each test, the vessel was filled with liquid nitrogen, supply valves were closed, and pumping continued to build up pressure to bursting point. The data show quenched and tempered (QT) or double normalized and tempered (NNT) vessels in the as-welded (AW) condition withstood greater burst pressures and stresses than did the stress-relieved (SR) vessels.

IMPACT TESTS 9% NICKEL STEEL RECTANGULAR VESSELS

	PR-1	PR-2	R-3
Heat Treatment	QT	NNT	QT
Test Condition	AW	AW	AW
Impact number	#9 of 11	#5 of 6	#7 of 7
Vessel Temp. (°F)	—293	—317	—308
Height of Drop, ft.	19	19	19
Kinetic energy of 4340 lb. weight (ft-lb)	82,460	82,460	82,460
Impact Velocity of 4340 lb. weight (fps)	35	35	35
Vessel pressure before Impact (PSI)	106	100	0
Total indentation after test (inches)	2.44	1.38	3.38

Table II. Data are shown only for the impacts which resulted in cracking or fracture of vessels PR-1 and PR-2. The two vessels were subjected to repetitive tests under increasingly severe impact and pressure conditions, leading up to the test which finally enforced failure. Additional impact tests were conducted on the failed vessels to determine further distortion and dimensional effects. For vessel R-3, which did not fail, data are shown only for the last impact.

For *maximum* strength . . . toughness . . . safety

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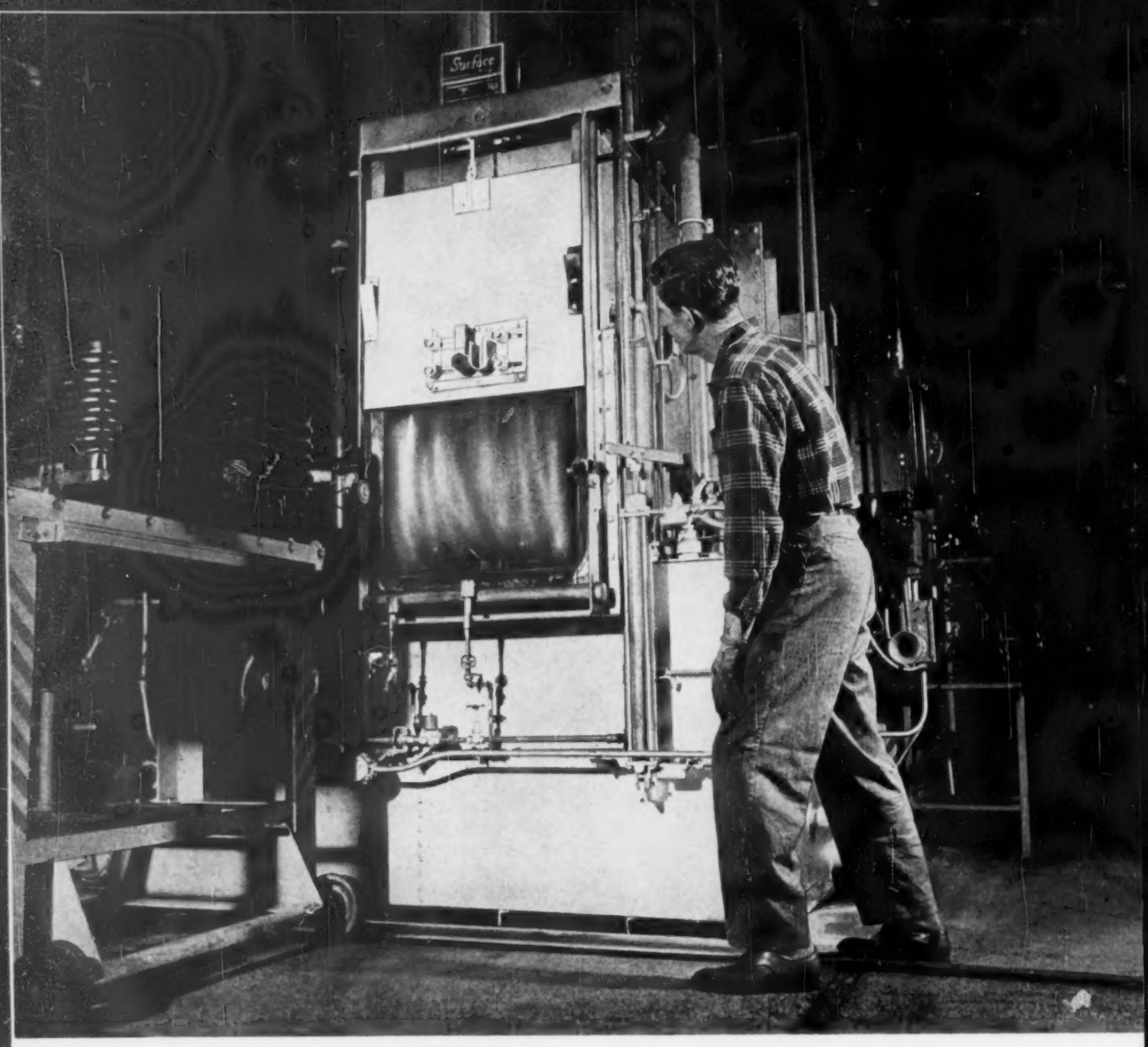
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel



Fifty different job lots are heat treated in 24 hours in this one Allcase® furnace.

The Ohio Metallurgical Service of Elyria, Ohio, is finding the Surface Allcase Furnace the solution to maintaining high quality, competitive prices, and fast delivery. A large variety of small job lots, such as small machine components, forgings, and automotive parts, are treated in a carbon controlled atmosphere, which adjusts automatically.

Critical temperature control has eliminated warpage of even the smallest springs. Unique Surface Power Convection permits uniform heating of high density loads and uniform atmosphere contact for all parts, eliminating rejections. Gas consumption has been reduced 30 percent.

Write for information: 2373 Dorr St., Toledo 1, Ohio. In Canada: 2490 Bloor St., West, Toronto.

SURFACE

SURFACE COMBUSTION, Toledo 1, Ohio/ a division of Midland-Ross Corporation MR

Are You Getting All That You Are Paying For When You Buy Cold Finished Steel Bars?

STANDARDS YOU CAN FOLLOW TO ASSURE BUYING THE BEST WITHOUT PAYING A PREMIUM

All cold finished steel bars are manufactured to industry standards.

But what you don't receive when you order just any cold finished steel bar are the *extra quality features* you get only in Bliss & Laughlin bars. You can *see* the difference... you can *work* the difference ... you can *have* the difference *at no extra cost.*

These quality features can be important in a number of ways:

PATENTED LUSTERIZED® FINISH

Lusterized finish means that the bar is cleaner, brighter, free from processing grit, lime and oils.

Because of this freedom from contaminants, machining costs are reduced, collet mechanisms are less likely to jam, and tool life is longer. If plating is required, preparation time is substantially lower. The surface can often be used for finished components without machining.

The patented, exclusive process, applied to all Bliss & Laughlin cold finished bars, is a development of Bliss & Laughlin research.

CLOSE TOLERANCES

The industry's closer tolerance standards, adopted several years ago, were also a development of Bliss & Laughlin pioneering work in improving manufacturing processes and procedures.

Long before they became industry standards, these closer tolerances were routinely followed by Bliss & Laughlin. You can therefore expect these close tolerances to be consistently maintained in all Bliss & Laughlin production.

SPECIAL SOIL-FREE COATING

After a protective layer of rust-inhibiting material is deposited on the bar during the Lusterizing process, a special, exclusive, transparent protective oil is added. This special coating repells contaminants and moisture during shipping and storage. It doesn't soil hands as do other protective coatings.

Bliss & Laughlin Lusterized bars are cleaner to handle, cleaner to work, and can be stored for longer periods without fear of rust and contamination from airborne material.

FAST, NATION-WIDE SERVICE

You can purchase Lusterized cold finished steel bars in mill quantities directly from strategically located Bliss & Laughlin mills across America or from steel service centers everywhere.

Available in rounds, squares, hexagons, flats and special sections, Lusterized bars are furnished in carbon and alloy steels. Either can be leaded.

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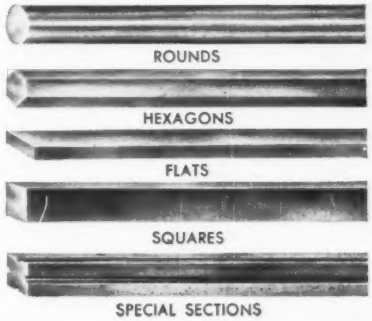
Take full advantage of Bliss & Laughlin's extensive research and development work on the machinability and metallurgy of cold finished steel bars. This service costs nothing and can mean more profits.

UNQUESTIONED DEPENDABILITY

For 70 years, Bliss & Laughlin has devoted its energies to producing only one line of products—cold finished steel bars. America's leading specialist, with the industry's most complete and most flexible mill service, Bliss & Laughlin concentrates its substantial resources and nation-wide facilities on serving customers well and dependably.

* * * * *

These are the standards you can follow when you wish to buy the best cold finished bar, without paying premium prices. Why settle for less? Simply specify Bliss & Laughlin *Lusterized* cold finished steel bars the next time you order or inquire.



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When 80-lb forgings take a 100-ton wallop...

...that's Alcoa Total Ability at work!

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Aircraft wheels are a case in point. Higher landing and take-off speeds, heavier loads, tubeless tires, higher tire pressures—all demand the ultimate in wheel strength. Another consideration is the need for bigger brakes. Well-designed forgings provide more strength and maximum space for full-sized drums or discs. Alcoa's vast forging facilities have provided the aircraft industry with its biggest and smallest forged aluminum—and magnesium—wheels.

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With experience and ability in every facet of aluminum, we feel no compulsion to beat the drum for any particular method of fabrication. We'll work with you from the design stage to the finished product—make significant contributions all along the way and proposals that are biased only in the direction of lowering costs. Let us prove it. Simply get in touch with your nearest Alcoa sales office, or write: Aluminum Company of America, 855-E Alcoa Building, Pittsburgh 19, Pa.

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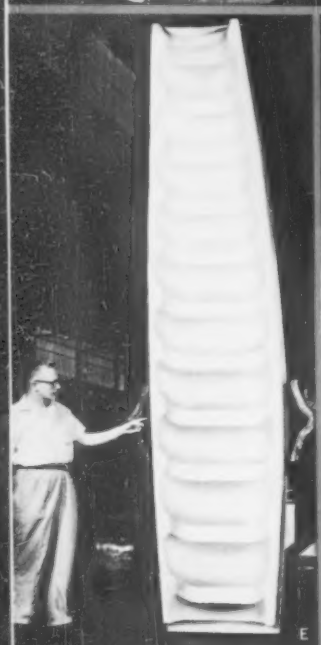
FORGINGS

HERE ARE A FEW ALCOA FORGINGS... BOTH TYPICAL AND UNIQUE...THAT MAY INTEREST YOU:



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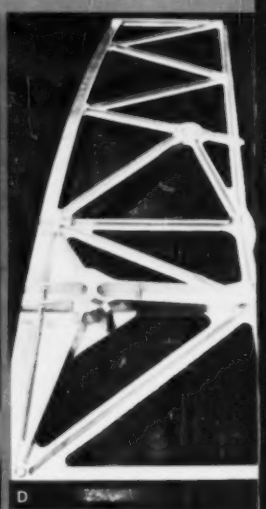

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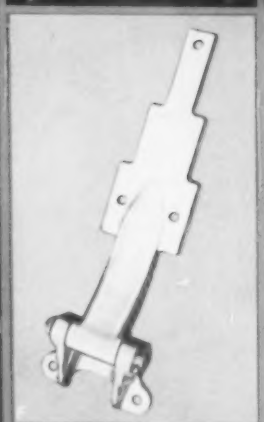

A. Tube 100 in. long and 40 in. in diameter, with stepped internal contour.

B. An aluminum forging answered both aesthetic and practical requirements in this chair base.

C. Tapered rings. Alcoa can forge them in diameters over 8 ft.

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I. Believed to be the longest closed die forging ever made, this wing spar measures nearly 23 ft.

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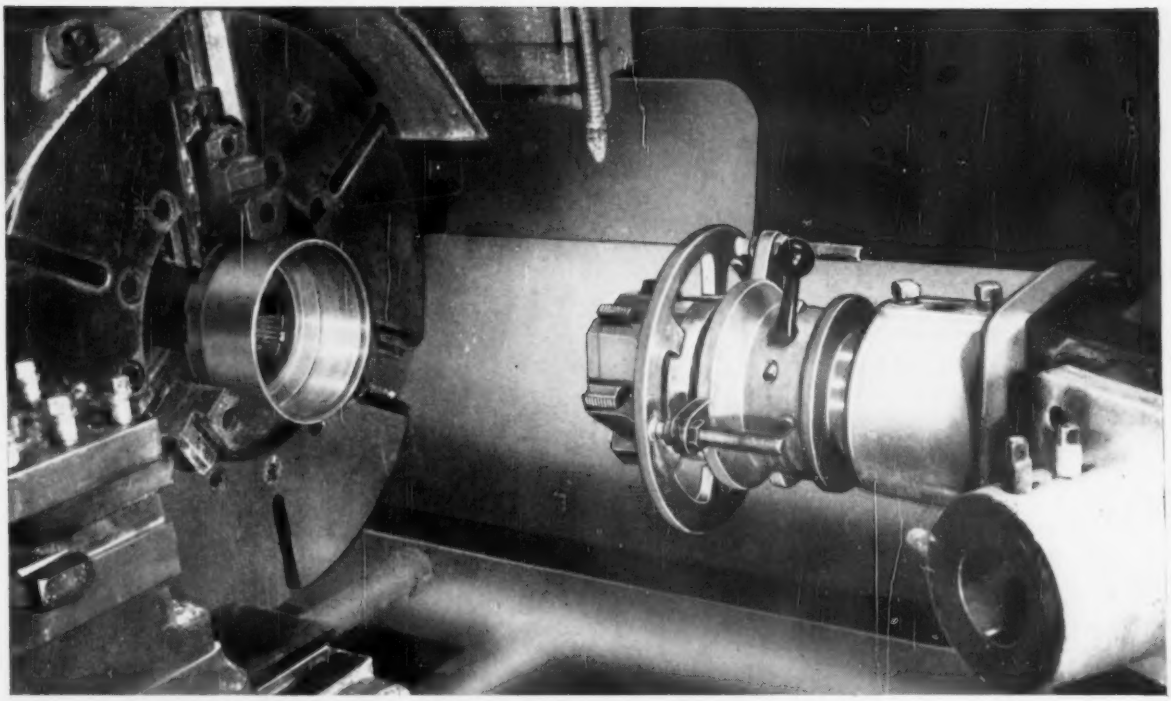

TAPPING 7⅝″ threads in tough steel

Rugged construction, allowing heavy metal removal in one pass, is one reason the LANDIS 6ALT Collapsible Tap is used to thread cylinder retainer caps for heavy duty hydraulic cylinders at the Cleveland Hydraulic Co., Bedford Heights, Ohio. 7⅝″ 8-pitch UN threads are tapped 2-3/16″ long in 40-50 carbon cast steel (normalized from 1600° to 1750°) to Class 2 fit.

Another outstanding feature of these LANDIS Taps is the detachable head, permitting the use of tap heads of various capacities on the same body. On the 6ALT shown, five heads allow a threading range of 6½″ to 13¼″. In addition, each head has a relatively wide threading range—the 7″ head used here threads all diameters from 6½″ to 8″. As a result, minimum equipment is required for wide range coverage, low initial cost and continuing economy of tooling is assured.

For complete information on LANDIS ALT Collapsible Taps, for threading all diameters from 1¼″ to 13¼″, write for Bulletin G-94.

500

LANDIS *Machine* COMPANY

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Metalworking Newsfront 6

THE GROWTH OF MARKETS FOR MACHINE TOOLS in countries other than big industrial nations is the biggest surprise expected to come out of a Commerce Dept. report. The report, yet to be published, points out that the growth of metalworking equipment buying in these countries has been taken up by exports from nations like Russia and Japan.

THE SHORT LINE APPLIANCE MAKER can survive in today's hectic market, says D. V. Petrone, sales vice president for Hupp Corp. Profit planning is the key, he says. Here's how: Price in terms of profit; know sales volume increase that is needed to pay for price cuts; and stick to accurate sales forecasting.

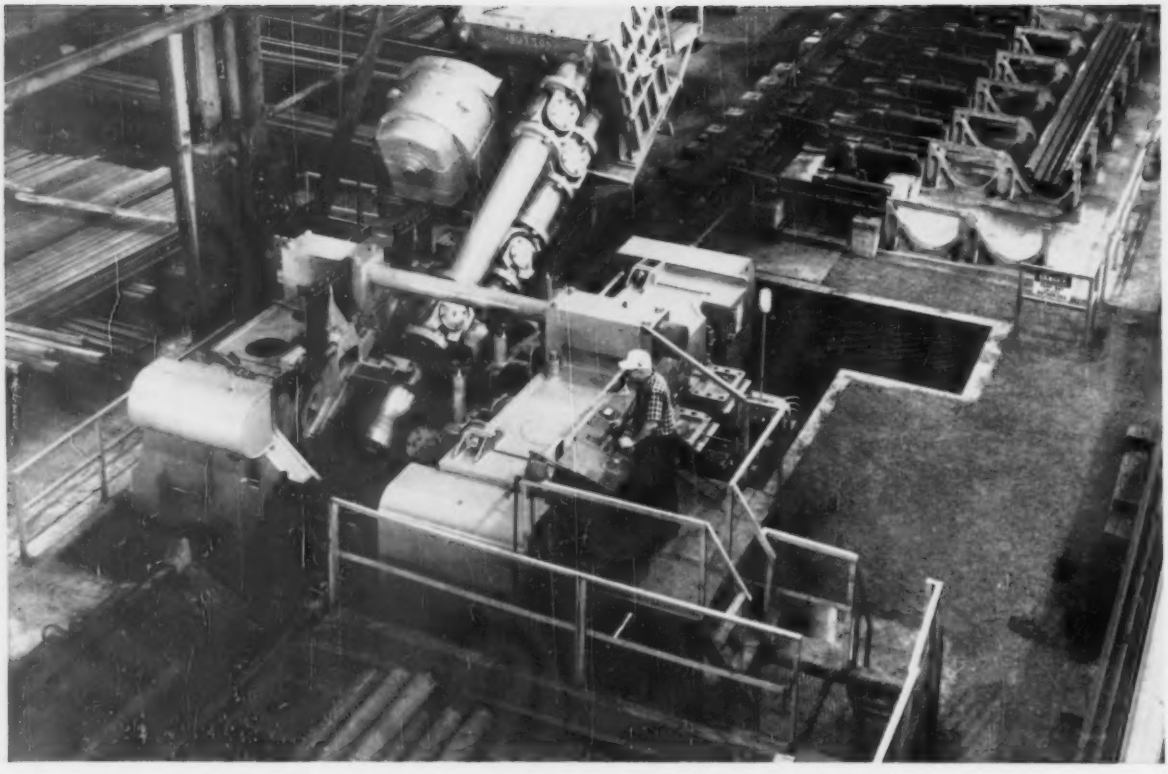
STAINLESS STEEL mufflers will be tried on all Ford cars having dual exhaust engines, says Allegheny Ludlum Steel Corp. Use of stainless mufflers was revealed in February by The IRON AGE. A special grade of stainless was developed for this latest automotive application by Allegheny Ludlum. Now, field testing is being extended to more models.

IRON BASE POWDERED METALS USAGE by the auto industry has increased more than 300 pct since 1954, says W. P. Balthrop, president of Chrysler Corp.'s Amplex Div. He predicts usage in the next five years will be increased by an added 100 pct. The average 1961 Chrysler Corp. car uses up to 103 powdered metal parts.

ONE OF THE NEWEST APPLIANCES, the automatic clothes cleaner, is showing strong promise. Norge Div. of Borg-Warner Corp. will boost May production of their dry cleaners by 17 pct over April.

FORWARD BUYING is more talked about than done, say some suppliers. Buyers are not moving purchases ahead in an attempt to offset rock-bottom inventories. Stocks in some major plants are one-half normal, and present plans call for them to stay that way through the first half. Two reports say that buyers are battling top level purchasing men and front line management to carry heftier stocks--to little avail.

GRAY IRON CASTINGS business is showing strength. Foundries in March shipped 89,824 net tons of gray iron castings, 2001 tons of ductile iron and 391 tons of high alloy iron. Foundries are running at 60 pct of "ideal" capacity.



Timken® bearings withstand extreme shock loads on Sutton's largest bar straightener

When the Sutton Engineering Company designed this "5BC" straightener for Sheffield Div. of Armco Steel Corp., they wanted to be sure it would withstand the shocks of straightening large diameter heat treated alloy steel bars at speeds of 30 to 90 f.p.m. and with high precision. Their solution for trouble-free performance—Timken® tapered roller bearings for the drive and idler rolls, speed reducer drive and universal joints.

Because of their tapered design, Timken bearings take any combination of radial and thrust loads. Timken bearings roll true, practically eliminate friction, save input power. And because of Timken bearings' higher capacity, Sutton engineers could save space by keeping bearing sizes to a minimum. What's more they had the advantage of using the new Timken pin-cup bearings in the drives to prevent creeping, assure positive lubrication and longer bearing life. Dependable performance is one of the reasons why Sutton uses Timken bearings for all its tapered roller bearing needs.

ON-THE-SPOT engineering service from our graduate-engineer salesmen solves bearing problems. They can help you select the one bearing from thousands that is exactly right for each position.

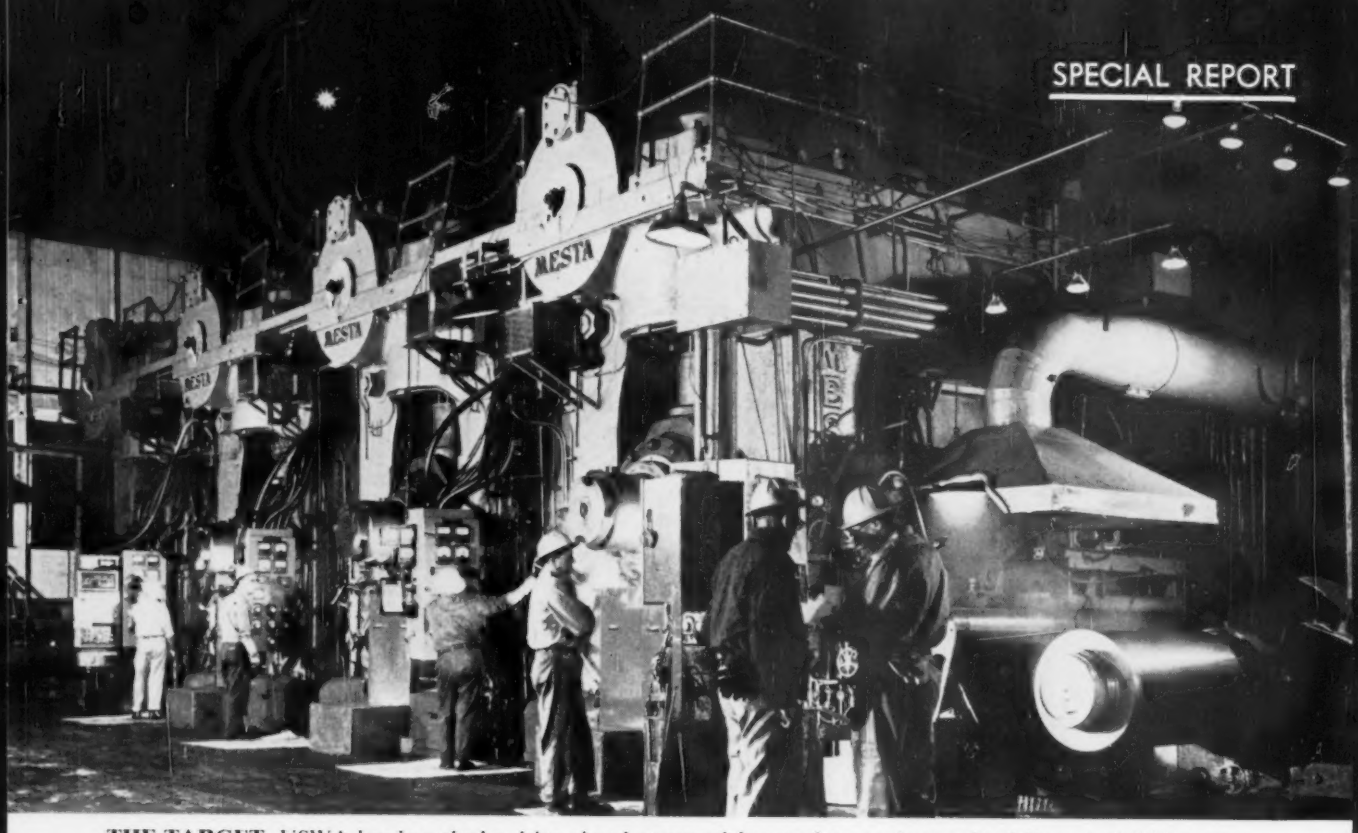
RESEARCH AND DEVELOPMENT, typified by the dynamometer above help keep Timken bearings your No. 1 bearing value. The data it provides helps increase performance of Timken bearings.

Industry rolls on

TIMKEN®

tapered roller bearings

The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ont.



THE TARGET: USWA has launched a drive aimed at organizing workers at Armco Steel Corp. in Middletown.

USWA Launches All-Out Drive To Organize S. Ohio Workers

The industrial area centered around Cincinnati is one of the last strongholds of large independent and non-union plants.

But the Steelworkers Union has put management on notice it has started an all-out drive to organize the workers.
By T. M. Rohan

■ "The last great organizing drives were in the '30's. Then there were so many men out of work all you had to do was print up some pamphlets, hold a few meetings and they flocked in to join. There hasn't been a great deal of organizing since then, and especially in the last 10 years. But we hope to recapture the spirit of those days."

This bit of history comes from Albert Whitehouse, director of District 25, United Steelworkers of America. And it points up the significance behind the union's recent announcement that it has launched a major organizing drive in southwestern Ohio.

The drive's goal: 30,000 new members. The target: A dozen or more metalworking companies in the industrial southwest corner of Ohio—concentrated in Cincinnati, Dayton, and Middletown.

Where Workers Are — Workers being wooed are either unorganized or belong to "independent unions." And they work for some big companies: Cincinnati Milling Machine Co. has about 4000 employees, but no union; Armco Steel Co. at Middletown has about 5500 workers represented by an independent union; and National Cash Register Co., Dayton, is the largest with about 12,000 employees represented by an independent union.

Smaller targets in Cincinnati include American Radiator and Standard Sanitary Corp., Cincinnati Shaper Co., R. K. LeBlond Co., Yuba Power Products Inc., American Tool Works Co., and Williamson Heater Co. Mosler Safe Co. and Herring-Hall Marvin Safe Co.,

Here are some comments from **Albert Whitehouse,** director of the Steelworkers District 25 on why and how the union has launched its drive to organize workers in Ohio's industrial southwest corner:

The last great organizing drives were in the '30's. . . . This area has been a thorn in our side for years and is the very bulwark of anti-unionism and conservative reaction. . . . **The workers who make the labor-saving machines of automation can sense they are the next to go.** . . . In effect, the USWA negotiates their contract now. . . . **They can't be parasites for all of their lives.** . . . We are going to try to arouse an old-time crusading spirit among the workers.

both of Hamilton, O., are other targets.

The Thorn—The big unions have long cast covetous eyes on this prime industrial area. But past drives have had less than resounding success.

"This area has been a thorn in our side for years and is the very bulwark of anti-unionism and conservative reaction," grouses Mr. Whitehouse. "The National Association of Manufacturers was founded by three Cincinnatians. The infamous Metal Trades Assn. was born and conceived here. And the old management attitudes are still here."

The companies have another explanation. "We follow an open door policy and have worked as a team for 70 years," says an executive at Cincinnati Milling Machine. "We don't want to start any fight now."

The Resistance — The company proudly points to its outstanding health program, going back to the four founding Geier brothers, as a reason why the company is still unorganized. There has never been a union election or a strike, despite several organizing efforts.

National Cash Register employees pay dues of 50¢ a month to their independent union; the Steelworkers charge $5. Organizing National would mean about $720,000 annually for the Steelworkers till, but the union took a crushing 9 to 1 defeat there in 1958.

Armco pays slightly higher wages than steelmakers with USWA contracts. It provides more life and health insurance, and other fringes. It has its own park and youth center for employees. And it hasn't had a strike at Middletown in 61 years.

Times Change—What makes the Steelworkers union think it now can succeed where it hasn't been able to make a dent before?

For one thing, the union feels it has a new appeal working for it.

"We keep very close to the workers. Lately we sense they are worried over loss of jobs to automation," says Mr. Whitehouse. "The workers who make the labor-saving machines of automation can sense they are to go next. Many of those laid off will never be back and the whole atmosphere is changing."

As for the better benefits many workers now have: "Among steelworkers, we find that the workers are not getting something for nothing," the union leader says. "Much of the difference is buried in the working conditions, seniority systems and incentive systems.

Down to Cases—"It boils down to specific cases. In talking to Middletown steelworkers we find that crews for specific jobs have far fewer men than for the same jobs in other mills. They are understaffed and can barely handle it."

A Free Ride—Nationally, about half the workers at Armco and its divisions and affiliates are already members of the USWA. But the other half, largely at Middletown and the Butler, Pa., Works, is independent.

The Steelworkers resent the fact that workers in the independent union plants often get a free ride at the expense of the other workers. "In effect, the USWA negotiates their contract now, since they follow the national pattern. They can't be parasites for all of their lives," says Mr. Whitehouse

Costly Campaign—A sustained organizing drive will cost money—lots of it. And it will undoubtedly take a sustained drive on the part of the USWA if it expects to achieve its goal. It could take as much as $500,000.

Organized Voice — The union knows it hasn't picked an easy job.

"We have no idea what it will take," Mr. Whitehouse admits. "Money alone is not enough. But we have the full backing of Pittsburgh headquarters, and there isn't a bigger drive in the country."

"We are going to try to arouse an old-time crusading spirit among the workers. Other unions have offered their help and advice."

Since the announcement there have been visits by organizers to homes of employees to ferret out grievances. And some handbills have been passed out at plants and meetings with small groups of Steelworkers working in the plants.

But the big push is yet to come.

Copper: Higher Prices Coming?

BULLETIN: American Smelting & Refining Co. raised its price for custom smelter copper to 30¢ per lb on Monday. Primary producers hadn't followed by the end of the day. But some producers said it could go higher.

■ Will higher copper prices ease some of the strain that has been building up on the U. S. market? Copper men in New York are sharply divided on this point.

Here's the picture:

Copper sales are reportedly good. Several major producers are sold out for May deliveries. And, custom smelters all report very strong demand. But underlying this strength is the heavy rate of copper scrap exports.

Supply Cut—The industry says a combination of low scrap generation earlier in the year, and excellent demand in Europe and Japan has cut the available supply to U. S. buyers. This, they say, forced many domestic customers to increase their buying of primary metal.

Also, foreign demand is forcing scrap prices to climb. The question now: Which buyers will be knocked off at what level?

Copper scrap is the raw material for custom smelters. To make a profit, primary metal must be sold for more than the cost of scrap plus conversion. The latter, as a rule-of-thumb, is usually about 4½¢ to 5¢ per lb.

The Decision—If the spread narrows, smelters must either raise primary metal prices or stop buying scrap.

An exporter to Europe says he will be out of the market if U. S. prices get much higher. He points out that he must add about 1¼¢ per lb to get the scrap to an overseas port. From there, the buyer pays the freight.

This exporter notes the cost of primary metal in Europe has not risen at the same rate as U. S. scrap prices. If this continues, he says, European buyers may find it more economical to buy primary metal.

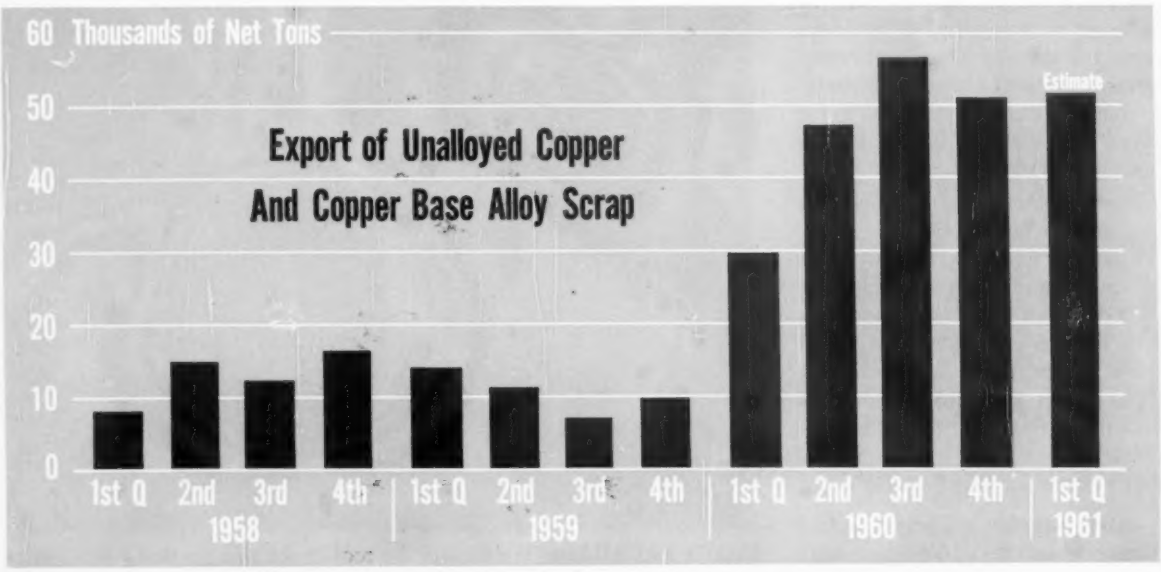
As for now, Japanese buyers seem to have the strongest position. Most of Japan's copper is sold internally.

Another Factor—The "x" factor is the Japanese system of alloting specific funds for copper imports. This covers unalloyed scrap as well as primary metal. The allotment appears generous enough to keep Japanese buyers in the world market. But again, if the world price for primary metal falls behind the scrap price, the Japanese may also import more primary.

No one seems sure why Europeans are buying so heavily. One source says it is unlikely they have been buying at this pace to build inventories. Europeans are probably, he says, using this import promptly. Another observer feels European mills are still uneasy about Africa and are laying in stocks of scrap.

Also adding strength to the U. S. market: Latest copper orders reflect a trend toward domestic inventory rebuilding. Copper executives won't appraise this situation, but they're sure it exists moderately.

More Copper Scrap Continues to Go Overseas



UAW Draws Bargaining Plans

Reuther Aims at 'Better' Unemployment Benefits

UAW president Walter Reuther unleashed his bargaining demands in Detroit last week.

Some observers call it a spectacular unemployment compensation fund.

By A. E. Fleming

■ Fortunately for automakers, it will be two months before their negotiating teams meet at the bargaining table with the United Auto Workers to open talks on new contracts.

It could take that long for them to digest the broad and sweeping ideas UAW president Walter P. Reuther came up with in Detroit last week. The union held its special collective bargaining convention.

Mr. Reuther's proposals, kept successfully under wraps until the convention, surprised even the 3000 delegates. But most were captured by, if not completely enthusiastic about, the imaginative approach of their leader.

The Plan — Strategy of Mr. Reuther seems to be this: To win collective bargaining demands by forging a two-pronged program aimed at the Big Three and Congress. He wants his program to implement a "flexible" reduction in the work week with no loss in pay when unemployment rises.

Both automakers and Congress may be dubious about this approach. President Kennedy already has voiced opposition to shortening the 40-hour work week. And soon after Mr. Reuther's remarks were made, word came from K. D. Cassidy, Ford Motor Co. vice president of industrial relations, that "burdensome cost increases would be a serious blow to industry."

Also Negative — There are factions within the UAW that don't hold Mr. Reuther's short-week theory in high esteem. These are the factions that have been rallying behind a program of 30 hours work for 40 hours pay with full-pensioned retirement at age 60.

The UAW leader indicated the 30-40-60 idea was not up his alley. He hinted that the work week could better be cut by other means. Among them: Longer paid vacations than the present three-week maximum; retirement at age 60 with full pension and Social Security benefits; control of overtime by management; and sabbatical leave for older employees so they can get further training and education.

The wide scope of Mr. Reuther's program also may be interpreted as an effort to unite his 1.1 million members. He'll do this while trying to develop as much latitude as possible when the Big Three bargaining opens in July.

Back to Work — "We're determined. And our number one demand is to get the unemployed back to work," he emphasized. "We're going to tell the auto companies. Here are the ways we think it can be done. We'll explore all of them with you, and if you've thought of some we haven't, put them on the bargaining table. We're flexible on

UAW'S REUTHER: "We'll patch the roof in the rain anyway."

how we're going to do it."

This could indicate a long, hot summer of bargaining, proposals and counter-proposals. There's little likelihood of an early agreement. Prospects are that talks will continue up to the minute when the Big Three contract with UAW expires on Aug. 31.

Neither side, however, is anxious to see a strike develop. Automakers sense a business upturn in the making this fall. And the union, already plagued by heavy layoffs, doesn't want to bargain under poor economic conditions. "We're going to the bargaining table in the rain with the roof leaking," said Mr. Reuther. "But we'll patch the roof in the rain anyway."

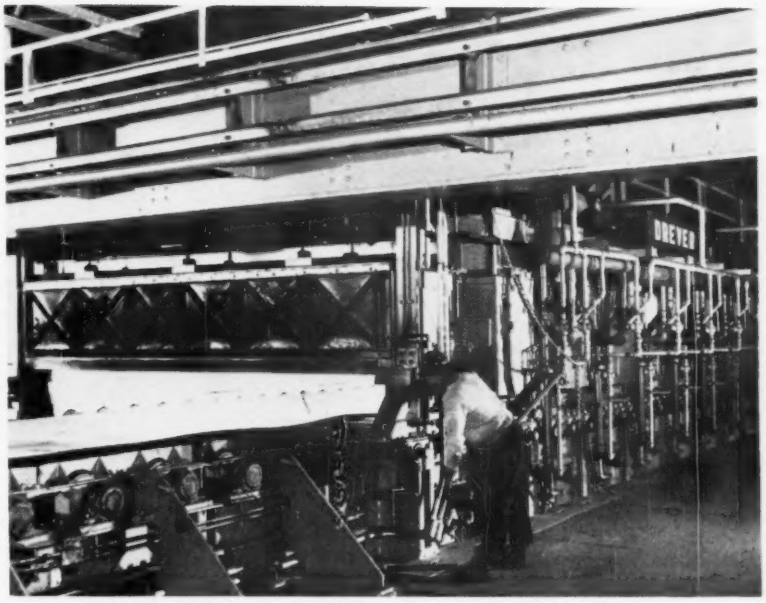
Fair Settlement—Said Mr. Cassidy: "We have no wish to take advantage of possible adverse economic conditions to force an unfair settlement."

Purely collective bargaining issues which Mr. Reuther proposed include: Salaries instead of hourly wages for production workers; improved Supplemental Unemployment Benefits with maximum duration up to 52 weeks; company payment of the entire cost of hospital-medical-surgical insurance (they now pay half); higher company-paid retirement pensions; an improved auto wage formula based on annual improvement factor raises and escalator clauses granting wage hikes when the cost of living rises.

Also, pay raises for skilled union tradesmen; better working conditions in plants; and an end to production speedups.

On the legislative front, Mr. Reuther suggested setting up a flexible Federal wage and hour law that calls for reduction of the work week in relation to unemployment. The law would have benefits for workers on short workweeks. The benefits would be financed by the companies.

Overtime Pay — The plan also calls for overtime pay for any work above 38 hours. The company would have the option of calling back workers and not paying premium overtime pay when times are good.



NEWEST ADDITION: To U. S. Steel's plate heat treating equipment is this second continuous quenching and tempering line at the Homestead Works. An alloy steel plate is shown entering the hardening furnace here.

U.S. Steel Urges New Design Ideas

■ A pitch for new design thinking and a close look at new heat treating facilities were given 500 engineers last week by United States Steel Corp.

U. S. Steel officials explained how high strength steels could be used with new design concepts.

First Viewing—It was also occasion for the first public viewing of what the company calls "the most complete and flexible heat treating equipment in the steel industry."

Included in this assembly are a new 160-in. plate treating line and preset 100-in. and 160-in. facilities. In addition, there are now facilities for heat treating thin gage materials, forgings and stainless steels.

New Products—In the area of new products, U. S. Steel said it is working to produce heat treated structural shapes. It is also trying for quenched and tempered steel with a yield strength of 140,000 psi.

Precipitation hardened steels now offer yield strengths over 240,000 psi, and there is "promise for development of yield strengths up to 300,000 psi."

Basic Research—In fundamental research, U. S. Steel is "striving to learn how strengths approaching the binding force between iron atoms, over 4 million lb per sq in., can be attained."

Held in Pittsburgh and including a tour of heat treating facilities at Homestead Works, the sessions stressed new initiative must be taken by steel producers in applications work. L. B. Worthington, president, revealed U. S. Steel is spending more research dollars after the development of new products than in actual development.

Steel Earnings: A Bleak Quarter

Slow Sales Slashed First Quarter Profits

Steelmakers put in a distressing first quarter and earnings reflect it.

But there's optimism the worst is over and profits will improve during the remainder of 1961.

■ The recession took the starch out of first quarter steel earnings. As a result of slow sales, the steelmakers issued anemic profit reports, far below first quarter '60. (See table.)

The contrast was great because in last year's first quarter mills were rushing out shipments to fill strike-emptied inventories. In this year's January to March period few companies earned their dividends.

Among the exceptions were National Steel Corp. and Inland Steel Co. Many steel companies operated at a first quarter deficit.

March Turning Point—Looking beyond the first quarter, there's optimism among steel executives about the balance of the year. Company after company points out the upturn began in March and is continuing.

"I am convinced," says Avery C. Adams, board chairman of Jones & Laughlin Steel Corp., "that our volume of business will increase in each successive quarter during the rest of the year. I believe we passed the low point in steel 75 days ago."

Mr. Adams points to these facts: J&L's index of production advanced from 75 in January to 80 in February and 85 in March. At the end of April it was running at 100 pct of its average (the ingot production in the 1957-1959 period).

J&L's unshipped orders are now about 30 pct higher than at the low point of the recession, despite an April increase in shipments.

The increase in orders is coming from all segments of the market for steel, including the auto market.

Other steel executives shared this viewpoint.

Shrinking Stocks — Roger M. Blough, chairman of U. S. Steel Corp., believes the market hit bottom in February. Steel inventories, he notes, have been reduced perhaps as much as 1 million or 1.5 million tons since 1961 began. Now an increase in inventories is likely.

He notes orders are now coming in at a higher rate than in the past ten months.

Earnings in the second quarter, says Bethlehem Steel Co. president Edward F. Martin, "will be considerably better than in the first three months and even better than indicated by the 25 pct increase in April output over the first quarter average."

Mr. Martin notes that Bethlehem had more than $400 million worth of orders on hand at the end of the first quarter, higher than in the two previous quarters.

Republic Steel Corp. president T. F. Patton comments, "While production and shipments are still well below normal, an encouraging upturn in orders and shipments developed in March and is continuing. This upward trend apparently signaled the end of inventory liquidation and a recovery from the decline in the steel business that started in the spring of '60."

Costs and Prices—Apart from the sales upturn, steel leaders are concentrating on two other subjects: (1) the continued cost squeeze, and (2) the need for an eventual increase in steel prices.

Avery Adams, J&L chairman, summed up the situation by commenting: "During the past two years and eight months, employment costs have increased by approximately 26¢ an hour. Steel prices have not increased during this period."

Steel Earnings: 1961 vs. 1960

A Depressed Quarter

COMPANY	FIRST QUARTER 1961	FIRST QUARTER 1960
U. S. Steel	$31,976,670	$112,578,752
Bethlehem	7,971,692	51,828,727
Republic	5,822,521	28,239,545
Jones & Laughlin	2,587,000	17,794,000
National	5,862,026	17,718,342
Armco	9,260,646	23,957,994
Youngstown Sheet & Tube	2,679,425	12,891,248
Inland	8,143,592	18,743,934
Kaiser	1,063,441*	6,686,660
Colorado Fuel & Iron	1,489,020*	2,846,692
Wheeling	410,000*	5,547,000
McLouth Steel	2,175,975	5,826,974
Pittsburgh Steel	1,246,956*	2,167,577
Granite City	1,910,275	4,313,655
Crucible	1,644,000*	2,725,000
Acme Steel	145,916*	1,988,303
Detroit Steel	118,168*	3,539,607
Alan Wood	225,762*	854,995
Copperweld	95,061*	1,389,174
Washington Steel	250,098	737,642
Eastern Stainless Steel	473,903	779,335

* Net loss.

Steelmakers Elect Top Officers

ACME STEEL CO.: G. Findley Griffiths was elected president and chief executive officer. He will also serve as chairman of the executive committee. Guy T. Avery remains as chairman.

WHEELING STEEL CORP.: William A. Steele was elected chairman and president. He succeeds John L. Neudoerfer as chairman. Mr. Steele has been with Wheeling since 1943, and president since 1958.

Brush Reduces Beryllium Prices

Brush Beryllium Co. has reduced prices of pure beryllium metal powders.

Price of Brush virgin powder (100 series) has been cut about 12 pct, from $71 to $62.50 per 20,000 lb base lots. Blend powder (200 series) has been reduced over 15 pct, from $64 to $54 per lb.

N. W. Bass, sales vice president, says larger volume production savings are being passed on to customers. A $6 million expansion of Brush's Elmore, O., beryllium metal refinery is nearing completion.

Hanna Buys Smelter To Market Nickel

Hanna Mining Co. is now making and marketing nickel.

The company acquired a smelter that processes ore from the only large U. S. nickel deposit. It has begun marketing high-grade ferronickel for stainless and other alloy steels.

Riddle Plant—Through a subsidiary, Hanna Nickel Smelting Co., it has produced over 100 million lb of nickel since 1955 at the Riddle, Ore., plant. All of it has gone to the government as strategic material.

W. A. Marting, president, says Hanna can now produce high quality nickel at a competitive price.

"We are confident that the demand for alloy steels in this country will continue to grow," he says. "Our nickel business will benefit accordingly."

Sales Start—Hanna has supplied raw material to the steel industry for years. It now has nickel sales agreements with major U. S. alloy steel producers.

It is one of the world's largest independent iron ore producers. Holdings are in Minnesota, Michigan and Missouri. It has a substantial interest in Iron Ore Co. of Canada, which can produce 12 million tons of ore annually from the Quebec-Labrador fields. Hanna is currently checking a large development of extremely high grade Brazilian iron ore.

Stock Service—The company will distribute nickel to steel companies and foundries from warehouse stocks in Chicago, Detroit, Pittsburgh and Riddle. The system is set up to provide fast service on less-than-carload lots.

Hanna's Riddle smelter was the first to use France's Ugine process to produce nickel. It involves electric furnaces, with impurities removed from the molten metal in a series of ladles.

Aerial Tram—Crude ore, with 1.5 pct nickel, comes from a Hanna deposit. It is moved to the plant over a 1.5-mile aerial tramway.

Last year about 85 million lb of nickel were used in the U. S. for stainless steel. The Riddle plant produced more than 22 million lb.

Germanium Found Near Sante Fe

Susquehanna Corp. is probing germanium deposits near Santa Fe, N. M.

Until now, primary source of germanium has been the Congo. It is used mainly as an active element in making transistors and semi-conductors.

Susquehanna says initial exploration indicates substantial quantities of germanium, as well as copper and uranium, near Sante Fe. The company has just opened a new uranium ore processing plant near Falls City, Tex.

10-Ton Unit Now Degasses Steel

A 10-ton facility for vacuum degassing tool steels has been installed by Allegheny Ludlum Steel Corp. at Dunkirk, N Y. It will now be possible to degass steel in the ladle or during casting.

A degassing unit of the DHH type was recently put into service by Crucible Steel Co. of America.

Another major specialty steel producer has installed a pressure casting machine. It will be used mainly to produce extrusion slugs of high strength steels.

INDUSTRIAL BRIEFS

NSMPA Elects—Harry G. Smith, president, Curtis Screw Co., Buffalo, was elected president of National Screw Machine Products Assn. at the national meeting in Boston this week. S. H. Balderson, of Davis & Hemphill, Elkridge, Md., was elected vice president. H. E. Wheeler, president, Mitchel & Scott Machine Co., Indianapolis, is treasurer.

Copper Choice—Norman Rosow, president, New York Brass & Copper Co., Inc., was re-elected president of the Copper & Brass Warehouse Assn. at the 10th convention.

Management Awards—R. Conrad Cooper, executive vice president, United States Steel Corp., received the Society for Advancement of Management professional manager citation. The Society's material handling award went to Charles S. Schroeder, retired research director, Yale & Towne Manufacturing Co.

Pioneer Honored — Roland P. Koehring, 40-year-employee of Delco Moraine Div., General Motors Corp., Dayton, received a plaque from the Metal Powder Industries Federation honoring his pioneering contributions to the advancement of powder metallurgy.

Welding Book — James F. Lincoln Arc Welding Foundation has published a new manual, "Design of Welded Structural Connections." The book summarizes current practices and gives examples and problems of applications. It is by Omer W. Blodgett, design consultant, and Dr. John Scalzi, associate professor of structural engineering, Case Institute of Technology.

Stelco Adds—Two new production units worth $33 million are operating at the Steel Co. of Canada, Ltd., plant in Hamilton, Ont. One is a 950-ft Sendzimir continuous galvanizing line. The other is a 400-ton open hearth furnace, which raises Stelco's annual steelmaking capacity to 3 million tons.

Complete Works—Sherwatt Equipment & Manufacturing Co. has completed its new plant addition at the Mansfield Works, in Roebling, N. J. The new facility will increase wire screen and grating production.

Extra Coating—Pipe Line Service Corp., subsidiary of American Steel Foundries, Chicago, has opened a new pipe coating and wrapping plant in North Lima, O. It is the second company facility to offer plastic pipe coatings.

Modine Move—Modine Manufacturing Co. is building a new production plant at McHenry, Ill. The company manufactures heating and air conditioning products.

Special Offices—Earle M. Jorgensen Co., steel and aluminum distributor, is building a new office building at the Oakland, Calif., service center.

New Quarters—Conforming Matrix Corp. has moved into its new plant at Toledo, O. The company specializes in electro-formed metal masks and clamps and pressure fixtures.

Abrasive Shift — Carborundum Co. and its subsidiary, Pacific Abrasive Supply Co., have combined operations in a new $1.5 million abrasive supply center in Los Angeles. All stocks, including the grinding and finishing systems, will be moved to the new location.

"How's business?"

Refined Cells—Kaiser Aluminum & Chemical Corp. has installed five special cells to refine super purity aluminum at its Mead, Wash., reduction plant.

Stainless Car—U. S. Steel Corp. has developed a new stainless steel covered-hopper car for railroads. It was designed for economical, "kitchen clean" shipment of bulk materials and is 16 pct lighter than conventional covered-hopper cars.

Latrobe Expansion — Latrobe Steel Co. will spend $1.3 million for capital improvements in 1961. The program includes a 30-in. vacuum milling furnace, a 3250 ton forging press and a 9-in. finishing mill.

Alabama Growth — Bradshaw Steel & Forge Co. will build a plant in the Birmingham, Ala., area to manufacture steel forgings for cast iron pipe markets.

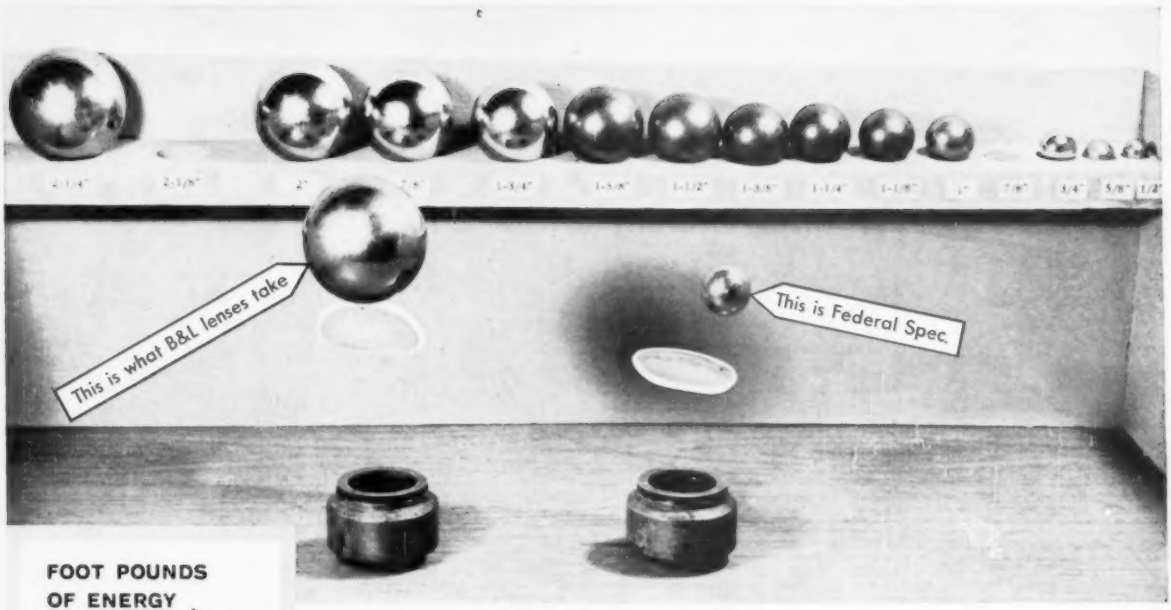
Better Brick—Construction is under way at Eufaula, Ala., of a $1 million rotary kiln to calcinate bauxite and kaolin clays for the Bessemer, Ala., plant of Harbison-Walker Refractories Co., producer of refractory brick.

Georgia Research—More than 300 tons of steel will go into the new nuclear research center at Georgia Institute of Technology in Atlanta. Plates and structural shapes will be supplied by Tennessee Coal & Iron Div., U. S. Steel Corp.

Highest Pipeline—Stupp Corp., Baton Rouge, La., has completed building and supplying pipe for the world's highest natural gas pipeline. It passes over the Grand Mesa of Colorado at 10,500 ft.

Buffalo Shuffle — Frederic B. Stevens, Inc., has moved its Buffalo plant and warehouse to 597 Northland Ave. It can now ship foundry and metal finishing supplies direct from stock.

Republic Shift — International Projects Div., Republic Steel Corp., has moved its headquarters from New York City to the company general offices in Cleveland.



GET *at least* TWICE THE EYE SAFETY YOU PAY FOR

Bausch & Lomb Bal-SAFE lenses twice as tough as Federal Standard

In the picture above, you see two bouncing steel balls stopped in mid-air by the high speed camera. The balls were dropped simultaneously from a height of more than 4 feet. Federal Standards Bureau specification for safety lens impact resistance requires exactly this test, using the 7/8" diameter steel ball you see on the right. Truth is, B&L Bal-SAFE lenses withstand impact from 2 to 10 times greater than Federal specification.

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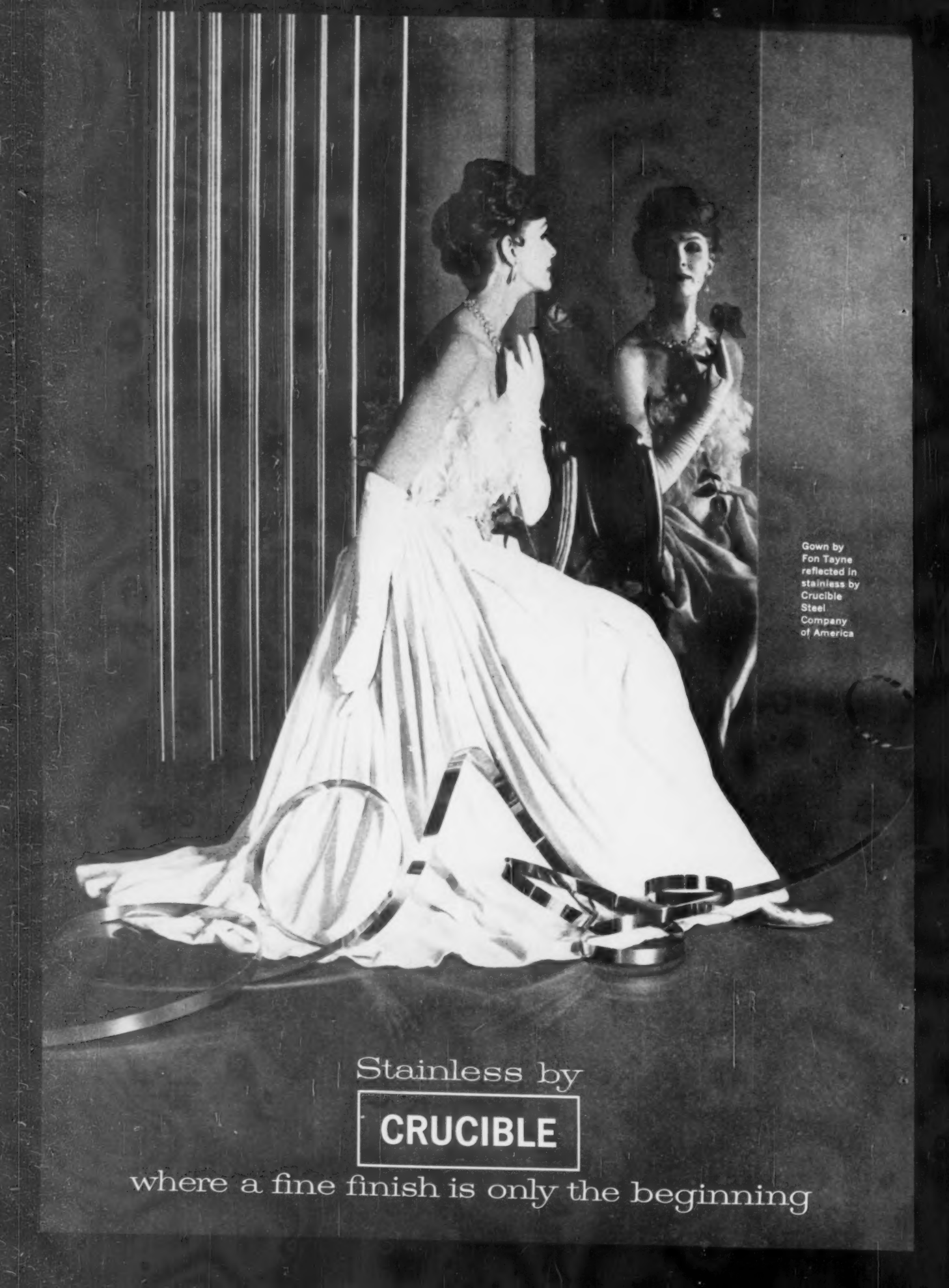
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How to Manage Technical Men

Successful direction of your engineers and scientists grows more important as technical advances speed up.

What's needed is a new type of manager, sensitive to the needs and motives of technical personnel.

■ Scientists and engineers are two of the most important groups in your company's future.

How much they do—and how well—is vital to your profits and your progress. The flow of new products, new techniques, and new methods comes largely from these employees.

But for effective results, technical personnel must be effectively directed. And the management of scientists and engineers is never easy.

Closing the Gap—Many studies show there's a serious gap between the technical man and the management man. But one of the most helpful discussions of the problem comes from Dr. Francis F. Bradshaw, consultant, General Electric Institute for Advanced Management.

Addressing a conference in Cincinnati on "Managing Technological Advance" he declared, "I don't mind a larger pay check for the manager of technical people. He deserves a lot of pay because he's doing the less interesting and maybe the less significant work.

"He ought to be compensated for not having the fun of the technological work. But we must control his authority so that he can actually be a servant of the technologists whom he manages."

Meeting Their Needs—"Technologists have many needs—they need a servant, they need an interpreter, they need a translator, they need a salesman, they need an organizer. But they do not need an authority because they are the authorities.

"They have the authority of knowledge, as far as they go, and they go farther and farther every day. Their kind of manager must be a new kind of man," Dr. Bradshaw says.

Managing Imagination — "The world has shrunk faster than our imaginations have expanded. The management of imagination is a different kind of thing from the management of materials, men, and money we are accustomed to managing.

"The manager who manages technical personnel has to pay more attention to the overall organizational arrangements of the social climate. He must give them more attention than he does to men as persons or as individuals, or to money, or to machines. The manager, not as a supervisor or authority, but primarily as leader, administrator, symbol, and image former can be the potential source of technological advance."

Despite management's efforts, engineers are dissatisfied. A study by Deutsch & Shea, Inc., manpower consultants, indicates many engineers feel management either does not understand or does not care about the technical man and his problems.

Watch These Areas Carefully

■ But, the study goes on, many of the areas of dissatisfaction are or could be brought under management's control.

As a group, engineers are intensely work-oriented and eager to prove themselves. Therefore their work assignments should be on a level that uses them to the full. If possible, they should be given a variety of work to arouse and hold their interest and motivation.

Some Freedom Needed — Engineers also show they like some degree of freedom to manage their own work. By giving freedom in some areas management shows it has confidence in the engineer's sense of responsibility, and capacity for initiative and self-direction. This does not mean, however, the engineer should be completely isolated from supervisors and associates.

Pay and Recognition—Salary is not always the overriding factor in an engineer's makeup. But it plays a major role in job satisfaction and should not be underrated.

In addition, recognition in all its forms does override all non-monetary incentives. Toward this end management could review present personnel policies and working conditions for engineers. The aim: Raising the engineer's prestige and feeling of professional status.

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The IRON AGE Interviews Paul Rand Dixon

THE VITAL ISSUES
Facing Management

FTC set to Speed Enforcement

Price discrimination, administered prices and other illegal trade practices will be watched more closely by the Federal Trade Commission.

In this interview, Commission chairman Paul Rand Dixon tells businessmen what they can expect and what they can do to help speed investigations.
By E. C. Beaudet, Managing Editor

■ **Q. Mr. Dixon, can any changes be expected in the Federal Trade Commission under the new Administration?**

A. We are planning to improve the enforcement policies of the Commission and the regulations governing it. We must improve them. The president has declared war on illegal trade practices and I'm going to do everything I can to strengthen the FTC's effectiveness. This includes a reorganizatian of the Commission.

PENALTY OF DELAY: New FTC chairman Paul Rand Dixon says that "Justice delayed is justice denied."

■ **Q. What do you hope to accomplish with this reorganization?**

A. Well, for one thing, I want to bring closer together the dates on which complaints about price discrimination are brought to us and the dates on which we act upon the complaints.

Too many people who have brought righteous complaints to the attention of the Federal Trade Commission have disappeared. In some cases, five or six years have gone by before a complaint has been heard. During this time, a company suffering losses because of illegal price competition can go bankrupt. This we must solve, some way. Justice delayed is justice denied.

■ **Q. Recently, Attorney General Kennedy requested the FTC to find out if companies previously convicted of antitrust violations were living up to court orders. What is your attitude toward this request?**

A. These past cases have a direct bearing on the economic life of our country. But heated arguments have been going on too long as to whether these past judgments are being followed. The big question is: "Have antitrust laws served their purpose if the convicted companies are still violating the law?"

With an investigation of these past cases, we will find out two things. First, if we find violations are still taking place we will report them to the Attorney General who will then seek civil damages. Second, if we do not uncover violations, we will have learned something important; that present antitrust laws are adequate to deal with these cases.

Also, we want to find out if there has been compliance with the cease and desist orders of the Federal Trade Commission itself. I will work with the Dept. of Justice on this.

To check up on these past cases, however, will re-

Who Is Paul Rand Dixon?

The 47-year-old chairman of the Federal Trade Commission is no stranger to Washington or to the intricacies of policing trade practices.

Paul Rand Dixon's reputation in the field was gained in his previous position as counsel and staff director of the Senate Antitrust and Monopoly Subcommittee, headed by Sen. Estes Kefauver.

It is said in Washington that the appointment of Mr. Dixon was the one thing Sen. Kefauver asked of President Kennedy.

As Commission chairman, Mr. Dixon is the agency's chief administrative officer as well as performing the quasi-judicial function of a commissioner.

Nor is the Commission itself new to Mr. Dixon. He joined the Commission as a trial attorney and served until 1957 in anti-deceptive practice and monopoly work.

He accepted the Senate subcommittee post in 1957 and assisted in developing and focusing attention of Congress on problems in the field of restraints of trade. He also directed work on the so-called "Administered Price" issue involving steel and automotive industries.

quire a larger staff and budget. The FTC had received a slight budget increase before this extra demand was placed upon its staff. Now we must go back to the Budget Bureau for more funds to do a better job in this important area.

■ **Q. What about Attorney General Kennedy's expressed hope of closer cooperation between the Justice Dept. and the FTC?**

A. We want to establish better liaison with the Justice Dept. This has been overlooked too long. We must work together and use the best tools in both agencies to stop illegal trade practices.

Those who claim the Justice Dept. and the FTC duplicate each others' work don't know what they're talking about. There is really no duplication of effort.

■ **Q. What areas of the laws governing price discrimination does the Federal Trade Commission consider the most critical at this time?**

A. I am not going to comment on the different legal aspects of FTC regulations on price discrimination. As Chairman of the Federal Trade Commission, I act as a judge as well as prosecutor. I will not make comments which may prejudice myself in future cases.

However, whenever and wherever we find that business is in violation of these laws, we will act swiftly and surely. We are planning to approach the problem of price discrimination on an industry basis wherever possible.

■ **Q. What do you mean by this?**

A. Without singling one out, let's consider an industry with 50 or more members selling competing products on a national basis. While working on a complaint against one or two of the members, we might find the same tactics are used throughout the industry. We would then go after other companies until these illegal methods are abandoned. The Clayton Antitrust Act covering such matters as price discriminations, mergers, and interlocking directorates gives us a tremendous amount of leeway in this area.

Now, some companies say they are aware of violations of laws against discriminatory pricing, but don't feel they should stop until the entire industry is told to do so. We don't go along with this attitude and plan to try case after case in an industry when such violations are brought to our attention.

■ **Q. We've heard a lot about "administered" prices. What meaning do you attach to this term?**

A. When I was counsel for the Senate Antitrust and Monopoly subcommittee, we called in scholars to tell

us what they knew about pricing policies. They gave us a theory and we set out to find if the theory held water. This is how the subcommittee came to look into the pricing policies of the steel, automobile, and the ethical drug industries.

The theory is that, in an administered prices system, prices are raised regardless of the effect of supply and demand.

■ **Q. If a company is not strong enough to bring about price changes within an industry, does it run the risk of violating pricing laws if it follows the price leadership of stronger companies?**

A. This is where there is a dilemma in the law. I don't think the law is precise enough in this area.

If companies conspire to set identical prices, as in the electrical companies case, they violate the law. But we don't know if the law is broad enough to cover a case where one company sets a price and others, without entering into a conspiracy, follow it.

We believe, however, that in those industries where identical prices exist and no price competition is present, it may be the same as if the industry members met to conspire and to fix prices. After all, there is no law which says a company must compete.

■ **Q. What about the Supreme Court case involving the Federal Trade Commission's request for access to confidential data submitted by individual companies to the Bureau of the Census?**

A. We are asking for copies of these reports because we believe the FTC has a right to them.

■ **Q. Why does the FTC want this information?**

A. In checking the breakdown of industries on a two, three, or four-digit basis, we have noticed in many industries that the four largest companies have anywhere from 50 to 70 pct of the economic power in a particular industry.

The Federal Trade Commission wants this information so that it can place the responsibility on those companies which have the economic power to control pricing within an industry.

WHAT IS THE FTC?

Federal Trade Commission was organized to enforce laws against monopoly and unfair or deceptive trade practices. Its function is to "prevent" through cease-and-desist orders.

It also guards against price-fixing, boycotts, deceptive advertisements, and activities that tend toward establishing a monopoly.

THE VITAL ISSUES

This is the third interview in a new series on the vital issues facing management.

The other interviews were with Dr. George W. Taylor, on the public in labor disputes, and Attorney General Robert F. Kennedy on merger laws.

Look for more top-level interviews on critical management problems in future issues.

■ **Q. How might business be of assistance in enforcing the laws against price discrimination?**

A. First of all, let me say that I believe well over 90 pct of all business desires to live within the law. Business should assist in law enforcement by trying to create a climate of free competition. It should insist that the law be enforced.

Let us hope that those who express platitudes about free enterprise and competition act to ferret out unfair, unethical practices.

■ **Q. How can trade associations help?**

A. Industry associations, of course, are formed for the benefit of a particular industry. They can, however, do much to help the nation's economic vitality if they stress maximum responsibility to their members in following the law against anti-competitive pricing practices. They should urge them not to practice pricing brinksmanship—finding out how close they can get to the line without going over it.

■ **Q. How serious an effect do you believe illegal pricing practices have on our national economy?**

A. America is close to the point where it is pricing itself out of world markets. Foreign producers are competing with us in key industries. We must compete on a price as well as quality basis.

The American people don't want regulated prices, they want a free economy. They want to show the Free World that free men can outproduce and outsell a controlled, slave economy like those of the communist nations.

It will take all Americans to do the job. It will call for influential Americans to do a bit of preaching to take up this responsibility and not wait until the sheriff walks down the street.

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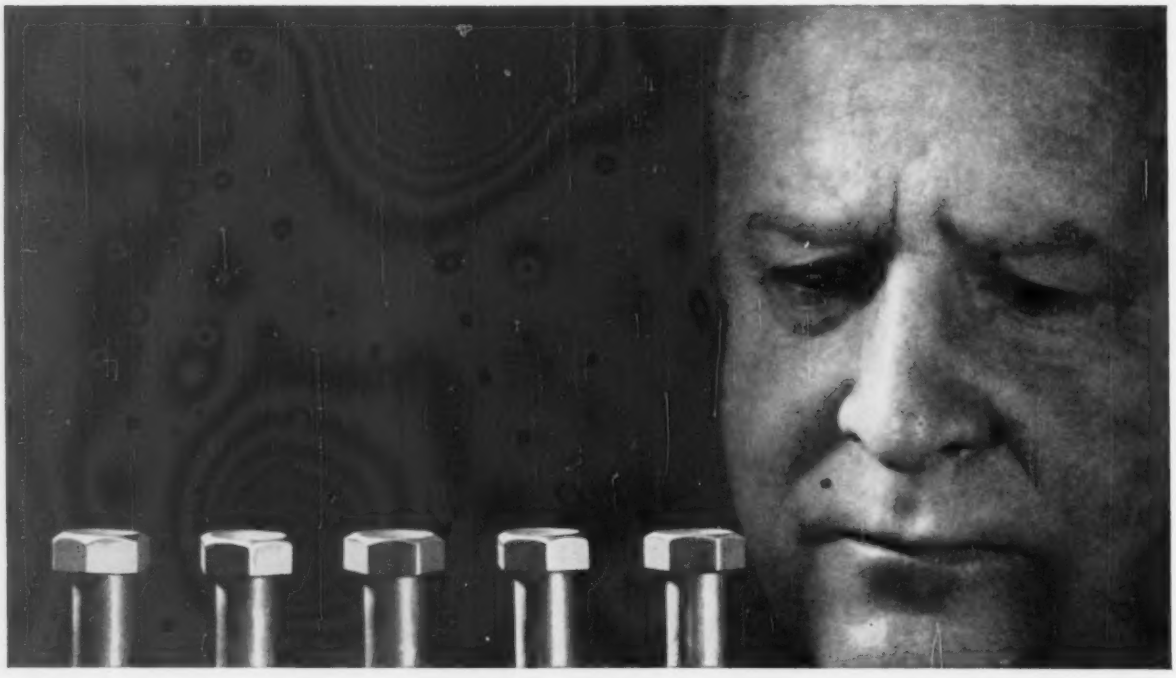

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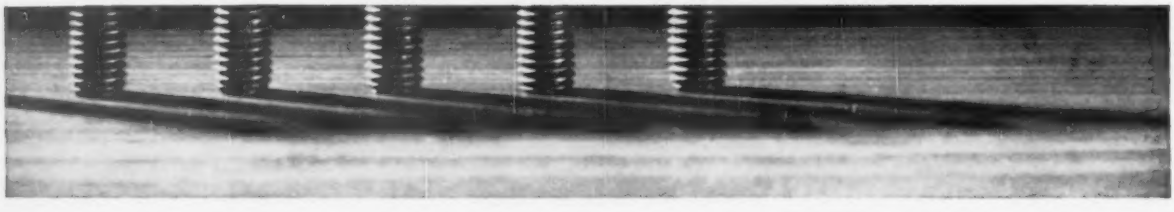

Fastener survey of blower units by RB&W points out where use of standard hex screws cuts costs, but not quality

In making a survey of a well-known manufacturer's fastening operations, the RB&W man found that alloy socket head screws were used extensively in large blower units.

But he found no genuine engineering need – the alloy's strength wasn't being utilized. And he found no production need – there was no tight spacing situation that required internal wrenching. Nor was there even an *appearance* need – screws weren't being installed in countersunk holes for a flush fit.

So there was no purchasing need, either. Why pay the premium cost for alloy fasteners? He recommended switching to *standard* high strength hex screws. The savings in fasteners per blower: 50 dollars. That's 50 dollars added to unit *profit* with no increase in price.

An RB&W Fastener Expert is no better than your engineers. He simply knows *what* to look for. Why not let him search for savings with one of *your* engineers? Maybe you're doing the best possible; but unless you're sure you're not wasting fastener dollars, it pays to consult Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

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Aluminum for Car Wheels?

Kaiser Experts Hope Volume Can Beat Cost Problem

Kaiser engineers predict car wheels will be the next automotive market for aluminum.

Cost is the big obstacle. But they see volume use overcoming it.

By A. E. Fleming

■ Car wheels could be the next major market for aluminum.

An automotive development team from Kaiser Aluminum & Chemical Corp. visited Detroit last week. Aluminum wheels keyed much of the discussions.

R. G. Stanwood, Kaiser's auto program manager, said firmly, "Wheels will be the next application of aluminum in cars."

Cost Holdup—Mr. Stanwood admits this won't come overnight. Cost is still the big problem.

At their present value, aluminum wheels won't become standard equipment on cars. And since cost reduction depends on volume, the delay will continue.

Pontiac does offer aluminum wheels now. Optional, they cost $100 a set and are supplied by Kelsey-Hayes Co.

Gradual Cuts—Looking ahead, Mr. Stanwood says, "The use of any new material is usually higher initially than the material it replaces. As aluminum wheels are gradually accepted, their cost will go down. It's a matter of volume—plus the cost of new equipment, of scrapping old equipment, and of instituting new production procedures.."

His guess is aluminum wheels could drop to $10-$12 a car, when properly designed and engineered in volume.

Brake Linings—Kaiser's aluminum wheels, weighing 9 to 18 lb, are cast around a cast iron liner. Engineers haven't looked into aluminum brake linings. But the Kaiser people hope someone comes up with them, "so we don't have to use an iron liner."

Kelsey-Hayes has made stamped aluminum wheels from the same shapes as steel wheels. A spokesman predicts further progress as alloy refinements come. "In high silicon aluminum, we've had good results in linings that may lead to elimination of the cast iron liner," he says.

Volume Tooling—Pontiac's aluminum wheels are made by the low pressure permanent mold process. They wouldn't have to be, according to Leo Swoboda, Kaiser chief automotive development engineer.

"The wheels could also be made by die casting," he says. "We've had no occasion to use this method initially, since interest was shown only in low production quantities which didn't justify greater tooling cost outlay."

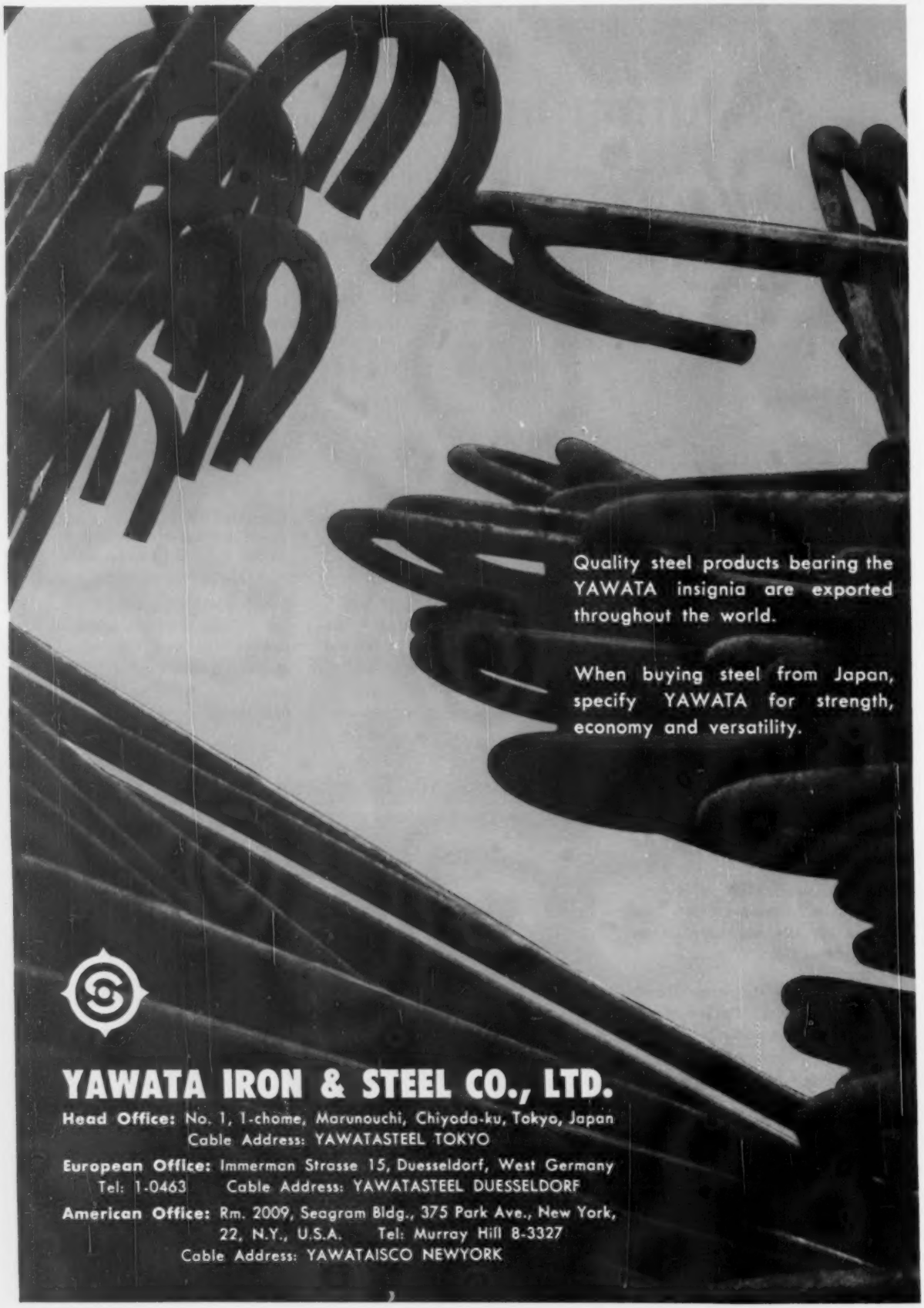
More Parts—Cars this year contain an average of 61 lb of aluminum, 10 lb of trim and the rest in functional parts.

"Naturally, we look for aluminum's greatest growth in functional parts," says Mr. Stanwood. "Especially in aluminum castings."

What about aluminum car bodies? "Body sheet aluminum is expensive," he says, "and under current conditions we don't think it an advisable avenue to travel to get aluminum into auto applications."

"Muskrat" Rambles on Land or Water

NEW CARRIER: American Motors Corp. has delivered its new "Muskrat" ¾-ton cargo and personnel carrier to the U. S. Army. It can travel through water at 3 mph and on land at more than 60 mph.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Seattle Set for World's Fair

Monorail, Tower to Feature Space Age Theme

Seattle's 1962 World's Fair will feature the Space Age.

Tops among the many exhibits will be a 550-ft steel Space Tower and Monorail overhead cars linking to downtown Seattle.

By R. R. Kay

■ The world of the future will be unveiled in Seattle next year.

Century 21 International Exposition will have as its theme, "Man in the Space Age." It will be the first World's Fair held in the U. S. in 23 years. More than $77 million will go into buildings and exhibits projecting life in the year 2000 against a backdrop of today's space age progress.

Steel Spire—Highlight of the Exposition will be a 550-ft steel Space Tower, topped by a revolving restaurant. It will tower over the 74-acre grounds, which will be linked to downtown Seattle by monorail overhead cars.

Other features include a $9 million Federal Science Pavilion and $7.5 million Coliseum. Billed as the most extensive science exhibit ever assembled, the Exposition is expected to draw 10 million visitors.

Breakthroughs — Several technological breakthroughs will be utilized in the building complex.

The coliseum will have a clear span of 360 ft in each direction. The sweeping roof will be braced by steel compression trusses springing from sculptured tripedal concrete abutments centering each of the four glass sides of the building.

Roofing will consist of 115,600 sq ft of anodized aluminum panels.

The Space Tower will stand on wide flange beams of the largest size rolled at the South Chicago Works, Columbia-Geneva Steel Div., U. S. Steel Corp.

New Monorail—Fair planners expect the monorail to interest transit and civic authorities. It is seen as one answer to mass transportation problems.

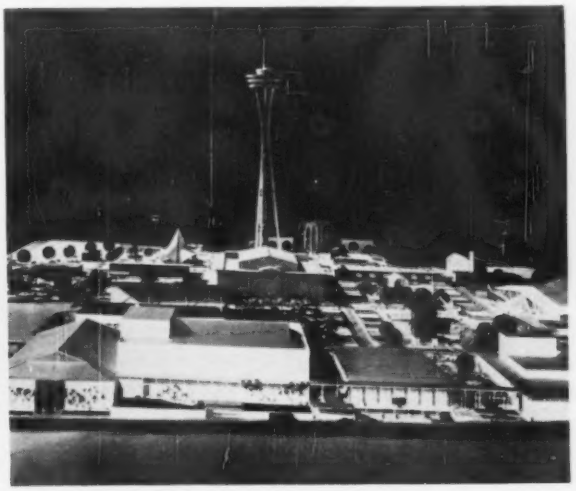
Two four-car monorail trains will operate shuttle service on the 1.2 mile route on 95-second schedules. Maximum load per train will be 450 passengers.

The glass, aluminum and chrome cars will be electrically powered. On rubber tires, they will run silently on dual tracks supported by a single column 21 ft above street level.

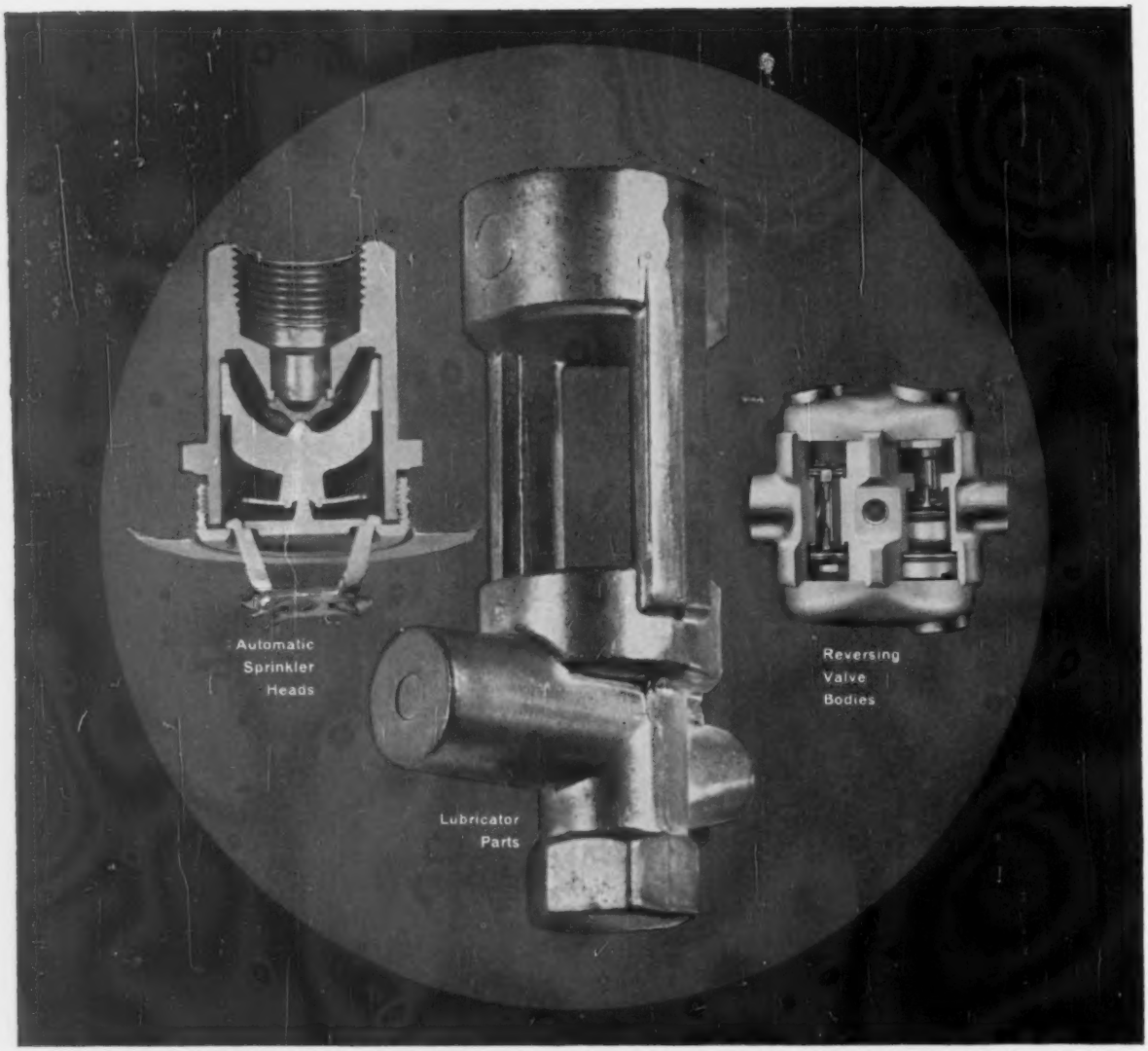
German-Made — Monorail cars are being made in West Germany by Linke - Hoffman - Busch Corp. Propulsion will come from two sets of General Electric Co. 100 hp motors per car.

The Exposition will give metalworking a chance to put its best foot forward, internationally. Already, Great Britain, Canada, Greece, several Far Eastern and five new African nations have accepted invitations to participate.

GOING UP: Over $7.5 million will be spent on the Coliseum for the Seattle Exposition. Going up now, it will have a clear span of 360 ft in each direction.



OPENING DAY: This is how the Exposition should look on opening day next April 21. The $77 million fair will have five "Worlds"; connecting boulevards.



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Tool Orders Are Picking Up

March Showed Gains; Prospects Look Favorable

There were definite gains in new orders for machine tools during March. Many wonder if this means business is picking up.

Considerable increase in auto activity is one favorable sign.
By R. H. Eshleman

■ Machine tool orders took a sudden spurt in March. Now, many observers wonder if spring won't bring increased activity for tool builders.

There has been a general feeling that the uncertainties in business have delayed capital spending decisions by management. The March gain may reflect a change in top-level thinking and a loosening of the purse strings.

In fact, there are some industrial experts who feel American plants can no longer afford to delay new equipment orders. To do so places them behind in the race for technological advances. Many of these advancements were revealed last fall at the Chicago Machine Tool Exposition. Industry has held off.

Still Weak—But looking at the first quarter as a whole, net new orders totaled only $172 million. That's actually 7 pct less than the first quarter of 1960 and only 7.5 pct more than the fourth quarter. Still, the figures for March show $69.6 million in new orders. This is a healthy boost of 39 pct over February's trickle.

March shipments totaled $55 million—about 1 pct below the monthly average last year. A detailed study of March's statistics reveals some interesting points:

Fastest Pace—Metalcutting tools set the fastest pace with almost $55 million in new orders. This brought the first quarter total up to $129,850,000. It means a rise of 7 pct over the first quarter of 1960 for metalcutting equipment alone.

On the other hand, orders for metalforming tools in March were behind January's orders. Domestic billings total nearly $11 million; foreign orders were up a bit to $4.2 million. Totals for the quarter were $42,200,000.

Regarding the March spurt in metalcutting tool orders, National Machine Tool Builders' Assn. notes some of the larger orders came from the auto industry. There also was activity in electronics and missiles.

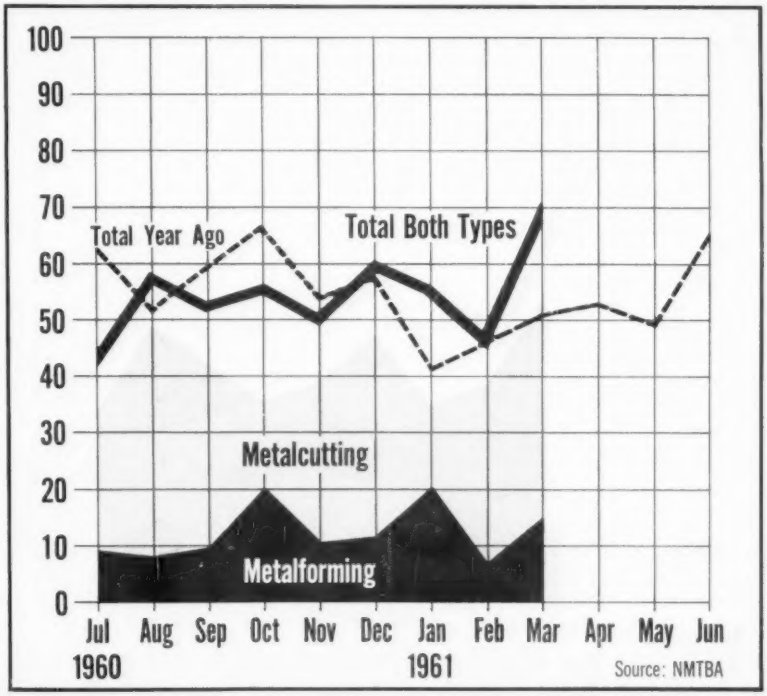
However, inside sources say the great volume of proposals and bids now going on in Detroit indicates there are some big programs about to break.

Engineering and Bidding — Repeated stories reveal that Chevrolet is in the middle of installing a straight four-cylinder machining line at Tonawanda, N. Y. This may make engines for the new intermediate (big-little) Chevrolet that is widely rumored to be the surprise waiting for the 1963 season.

Considerable engineering and some bidding is also reported on a companion six engine for the same car. It is frequently heard that tooling may be ordered for Canadian engine plants and the Holden division of General Motors.

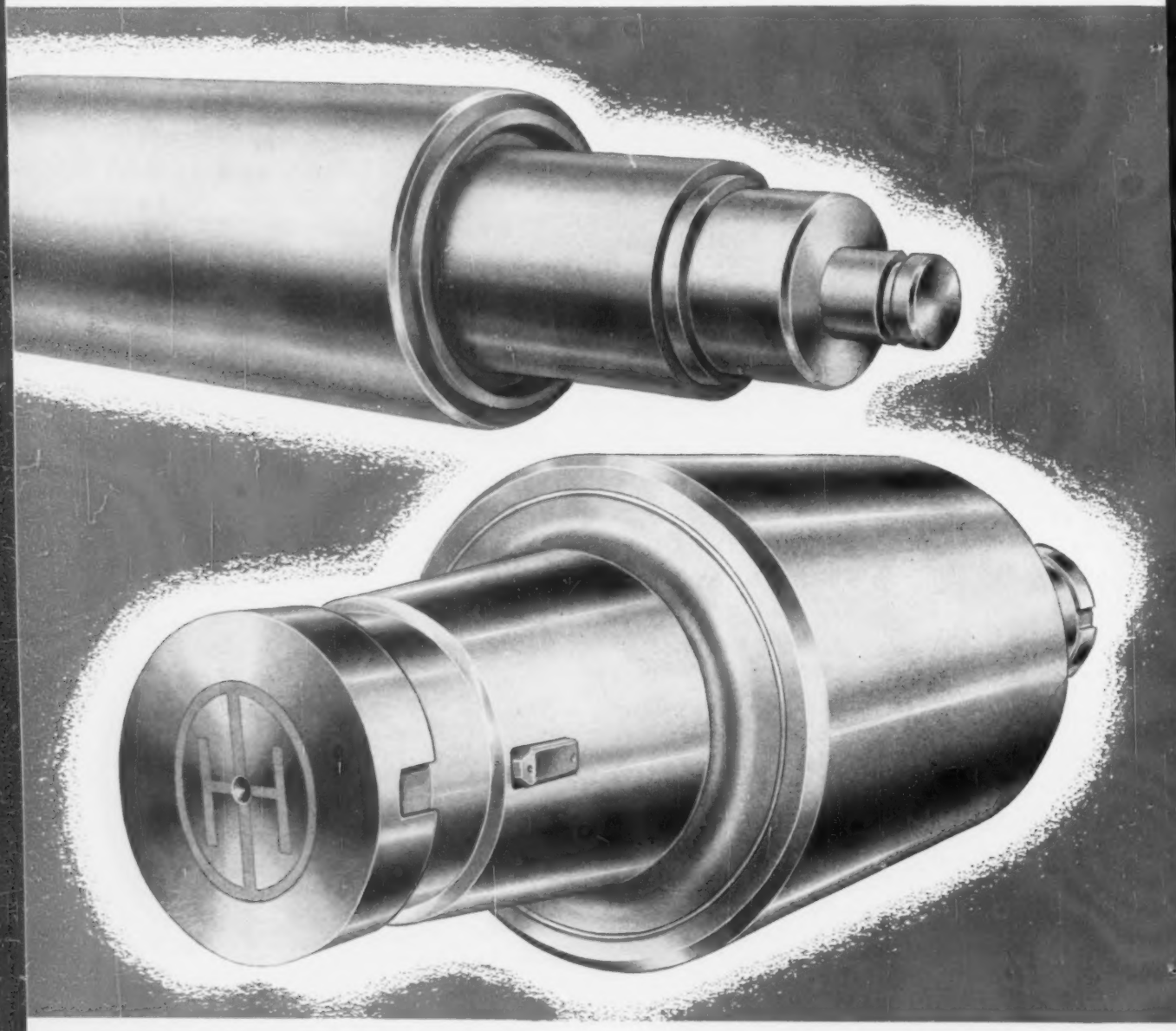
MACHINE TOOLS–NET NEW ORDERS

In Millions of Dollars — Metal Cutting and Forming Types



Ohio Rolls

Shaping Metal for all Industry



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K. T. Middleton, elected president, Fafnir Bearing Co.

R. W. Simon, appointed vice president, United States Steel Corp.

Lukens Steel Co.—**J. W. Herman,** elected vice president and treasurer.

Westinghouse Electric Corp. — **V.O. Clements,** appointed assistant to the vice president, southwestern apparatus sales region.

Detroit Hoist and Machine Co.— **G. B. Martin,** elected president; **R. W. Fleming,** elected treasurer.

Haloid Xerox Inc.—**S. M. Linowitz,** elected chairman of the board of directors.

Ilikon Corp.—**L. J. Bonis,** appointed executive vice president.

M. S. Kaplan Co. — **Bernard Landau,** elected vice president.

National Lead Co.—**G. W. Corddry** and **C. M. Merrell,** elected vice presidents.

Rockwell-Standard Corp.—**Harry Fante** and **F. W. Parker, Jr.,** elected executive vice presidents.

Vulcan Materials Co. — **W. H. Sowers,** elected executive vice president, Chemical and Metallics.

Vitro Corp. of America—**C. S. Payson,** elected chairman of the board.

Omark Industries, Inc. — **E. P. Skralskis,** named executive vice president, operations within the U. S.; **H. G. Cutright,** appointed vice president, marketing.

Bristol Brass Corp.—**Donald Gay,** named vice president, sales; **J. T. Hassett,** named vice president, works manager; **C. H. Gustafson,** administrative assistant to the president.

Allis-Chalmers Mfg. Co. — **John Druml,** appointed manager, Quality Control Dept.; **R. M. Casper,** appointed general manager, Power Equipment Div.

Crucible Steel Co. of America— **W. G. Hassel,** appointed manager, Tonnage Products Div.

Harold Etherington, appointed general manager, Atomic Energy Div., Allis-Chalmers Mfg. Co.

Federal-Mogul-Bower Bearings, Inc. — **Norman Currin,** appointed controller, Bower Roller Bearing Div.

Daystrom, Inc. — **K. M. Miller,** named vice president.

R. C. Mahon Co.—**R. C. Palmer,** elected president and a director; **C. M. Hargraves,** named manager, Industrial Equipment Div.

Hanson-Van Winkle-Munning Co.—**L. M. Hague,** elected chairman of the board and chief executive officer.

Hubbard and Co.—**J. C. Monday,** elected vice president and general manager, Hapco Div., Pittsburgh, Pa.

(Continued on P. 78)

J. S. French, appointed general manager, Motorcraft Div., Ford Motor Co.

American Refractories & Crucible Corp. — **A. P. Raeburn,** elected secretary-treasurer; **C. H. Pierce,** appointed director, sales; **D. R. Rosling,** named head, engineering sales-service dept.

Fairmont Aluminum Co.—**C. R. Sanford,** named manager, Louisville, Ky., branch sales office.

Pittsburgh Plate Glass Co.—**B. J. Smith,** appointed manager, Springdale, Pa., paint factory.

Westinghouse Electric Corp. — **C. P. Myers,** elected vice president; **A. J. Gilbreath,** named midwestern regional sales manager, air conditioning div.; **John Burns,** appointed asst. to the manager, large and medium turbine dept.; **F. R. Malone,** named sales manager, apparatus marketing div.

Borg-Warner Service Parts Co.—**C. G. Geiger,** appointed sales manager.

W. J. Whitehouse, appointed director, manufacturing, Pesco Products Div., Borg-Warner Corp.

R. M. Russell, elected executive vice president and a director, Acoustica Associates, Inc.

Cerro Sales Corp.—**Ivor Thompson,** appointed vice president.

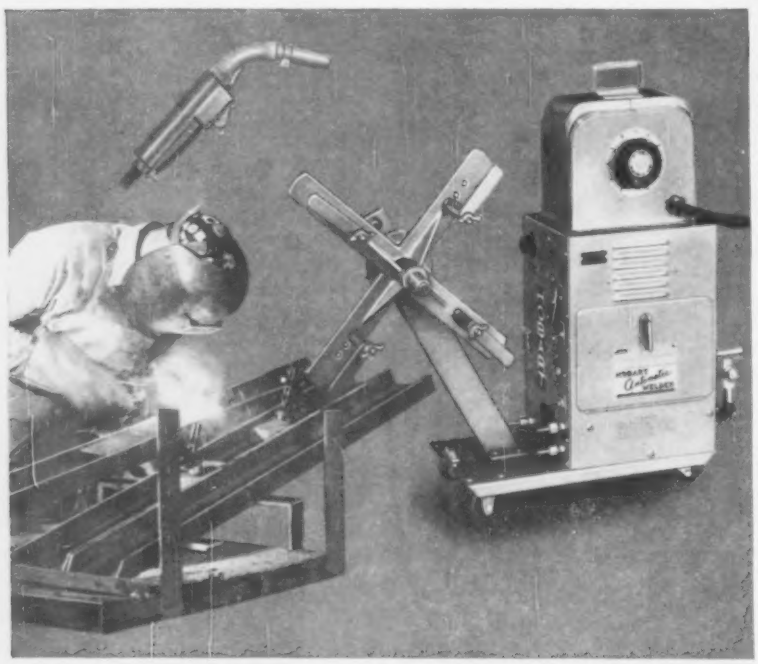
Syntron Co. — **W. V. Spurlin,** named vice president and chief engineer.

Trans-Plastics Corp. — **Reuben Hitchcock,** named president; **T. R. Stevenson,** named vice president.

Wellman International, Inc. — **J. A. Phillips,** elected vice president.

Cleco Air Tools Co. — **John Hobbis,** named manager, Cleveland Div.

Dow Chemical Co. — **J. G. Mezoff,** named head, metals dept.



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A. T. Duff, appointed assistant to administrative vice president, facilities planning, United States Steel Corp.

Struthers Wells Corp. — **J. F. Sweeney,** elected president and chief executive officer.

Landis Machine Co. — **D. E. Stoner,** appointed works manager.

Luria Bros. & Co., Inc.—**Jack Kaye,** named vice president; **A. J. Martin,** named manager, West Coast non-ferrous metals operation.

Quicfrez, Inc.—**B. S. Tremlett,** named president.

Lake Erie Machinery Corp. — **E. A. Rich, 3rd,** named president.

James Campbell Smith, Inc. & Correct-Air Corp.—**T. R. Eberwine,** elected vice president.

Information Systems, Inc. — **W. W. Johnston,** appointed vice president, operations, for Panellit Service Corp.

Emhart Manufacturing Co.—**E. A. Cooper,** elected vice president.

Corning Glass International, S. A. —**John Echternach** and **Pierre L. Roederer,** elected vice presidents.

Mueller Brass Co.—**G. I. Duddy,** appointed district sales manager, Atlanta; **R. J. Williams,** appointed district sales manager, Houston.

Philco Corp.—**W. F. Pigman,** appointed product sales manager, research div.

Precision Castings Co. — **Ernest Currie,** named sales manager, Chicago.

Palumbo Bros., Inc. — **Gene Kankowski,** named sales manager.

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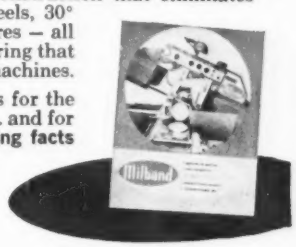

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Inductotherm now offers the greatest space-saving, most economically-operated induction melting system in history. Once you've compared the Inducto Integral 15, you'll never be satisfied with a spark-gap converter. What's more, the 15-kilowatt Integral 15 has the same melting capacity as 20-Kw spark-gap units.

Compare Installation The entire unit occupies only 35" x 40" of floor space. The motor-generator, capacitors, transformers, and all controls are packaged in a single, compact console. Completely pre-assembled and pre-tested before delivery . . . all you do is tie-in power and water lines and you're ready to start melting. Radio shielding problems are eliminated.

Compare Operation Whatever your melting problem . . . in small foundries, in research laboratories . . . you achieve optimum power for fast, efficient melting with minimum metal loss. In addition, the Integral 15 easily maintains a balanced 3-phase load . . . you can connect two furnaces to one power control . . . and it's readily adapted for vacuum melting.

Compare Maintenance No more hydrogen to purchase, store, feed, and dispose. Moreover spark-gap converters operate at extremely high voltages with peaks up to 20,000 volts, while the Integral 15 operates at a constant 220 or 440 volt coil voltage. Safety factors increase, . . . arcing problems drop almost 99 percent. Costly mica insulation between coils is eliminated. In fact, the *only* maintenance needed is routine lubrication.

Compare Cost The Integral 15 costs a little more than spark-gap units. But you start saving money the minute you start operation . . . in time, metal, maintenance and power consumption. You can amortize the cost differential in a matter of months. And your savings are the same whether you purchase an Integral 15 outright or use Inductotherm's unique rental or lease-purchase plans.

Compare the Facts We'll gladly send you complete details on the Integral 15. Write for Bulletin 20-15. Other Inducto "Integral" models available with capacities of 30, 50, and 100 Kw. Address: Inductotherm Corporation, 412 Illinois Avenue, Delanco, New Jersey.

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Special Trade-In Offer

Realizing that the Integral 15 obsoletes many spark-gap units just a few years after purchase, Inductotherm plans to share this early obsolescence with their customers by offering a trade-in allowance of 50% of the original purchase price of 20 Kw Inducto spark-gap converters toward the purchase of the new Integral 15. This offer applies only to ***original*** *purchasers of 20 Kw Inducto Melters and may be withdrawn at any time.*

Tests at 150 Miles Up

How will man react in outer space? How well will materials hold up? Test results of men, materials and equipment for space systems and capsules are most valuable when obtained under

ALTITUDE CHAMBER: 30 ft of outer space.

actual flight conditions. Thus, a major tool in Republic Aviation's Space Environment and Life Science Lab is this 30-ft long altitude chamber. In it, conditions up to 150 miles can be simulated.

Pares Vehicle Weight

Magnesium-lithium alloys, 20 pct lighter than standard magnesium alloys, are potentially useful in missile and space structures, reports Battelle Memorial Institute. They appear to be the lightest materials suitable for structural use. A plus feature of these alloys is their excellent resistance to spalling and penetration by high-velocity fragments, a point to consider when designing space platforms and satellites.

Form Parts Underwater

A controlled underwater explosion facility to use in forming parts for the Atlas ICBM and the Centaur space vehicle is slated for Convair Astronautics. Officials say the new forming method will reduce tooling costs by 40 pct. They say the division plans to use the technique to fabricate bulkheads, tubing and ducting.

Crash Propellant Program?

Solid-propellant space boosters may soon get a much larger share of the nation's space money. The House Committee on Science and Astronautics will give "serious consideration" to increasing funds in the 1962 budget for solid-fuel boosters. Maj. Gen. D. L. Ostrander, head of NASA's rocket program wants the $3.1 million solid-propellant program boosted by as much as $15 million. And the Kennedy administration is now making a study to see whether a crash program for solid-fueled boosters be started.

Balloons and Space Ships

Landing space vehicles has posed tricky problems even for Russians, claim scientists. However, engineering tests show a real dark horse—balloons of Dacron-neoprene, plastic materials, or woven high-temperature metals, inflated by pressurized gases stored in fiber-glass bottles. These would inflate automatically to give effective flight-path alignment and high-speed drag.

Metrology: On the Upgrade

The National Bureau of Standards' program to upgrade metrology, the science of measurement, is well on the way. The Martin Co. and others

TINY CELLS: 0.01-0.001 pct calibration.

will soon start calibrating standard cells, which in turn, will be used to calibrate specialized instruments. The urgency of the program is pointed up by Russian claims in this field.

Huge Ball Bearings

Seven huge precision ball bearings, each more than 13-ft diam, have been made for America's latest air-defense radar system. Each bearing will support a giant radar antenna. Made by Kaydon Engineering Corp., Muskegon, Mich., the bearings are designed to operate under wide temperature ranges for at least ten years. To provide accuracy in rotation, tolerances are equal to that of much smaller machine tool bearings.

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How Explosives Weld Metals

Success in Metal Forming Triggers Interest in Joining

Interest in explosive welding is growing as research groups bring to light more and more intriguing highlights.

What makes this technique work? How can it be used?

■ The use of explosives in metalworking is not confined to forming. Welding is in for its share of the research dollar.

Though work is still mostly in the development stage, several reports given at recent ASTME meetings indicate rapid progress in this new approach to joining.

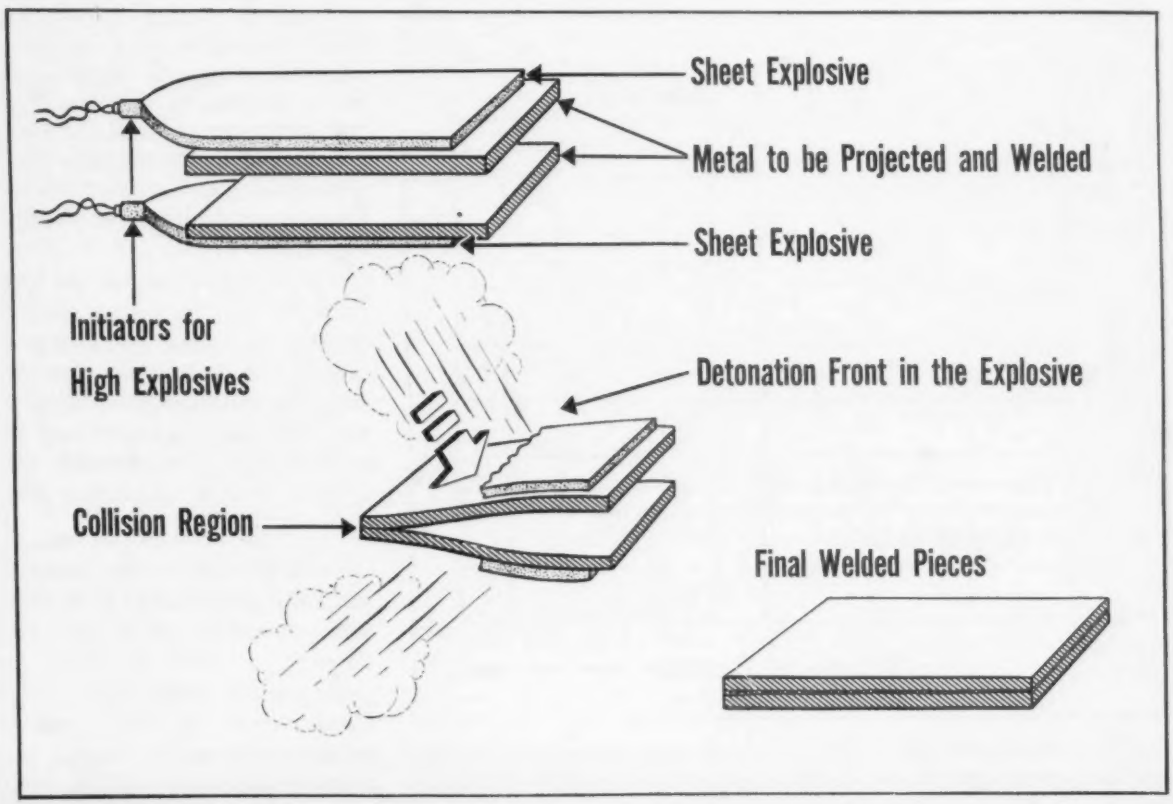
Systems studied include: Aluminum to aluminum, stainless steel and nickel alloys; stainless steel to stainless steel and nickel alloys; copper to copper.

Shows Promise—Applications of explosive welding are apparently limited only by cost and production techniques. Though, the new method isn't likely to replace normal welding methods, there are certain areas where it shows promise.

One, in particular, is where heat lowers the strength of the metal. (There's no heat when explosive welding.) Another is for welding those reactive and refractory metals which tend to give brittle welds.

Dissimilar metals that combine to form brittle intermetallic compounds are naturals for explosive welding. Researchers find a very narrow weld zone when using explosives. "There is very little diffusion across the weld and it appears there may be no limitation to mixed metals," report D. E. Davenport and G. E. Duvall

Surface Jetting Joins Metal Parts



ot Stanford Research Institute.

Other Advantages — How about cladding of metals? As Messrs. Davenport and Duvall point out, "One of the most interesting aspects of explosive welding is that the multilayer bands often necessary for joining of metals may be eliminated."

The lack of a fillet or bead is another advantage of explosive welding. It's of particular value when machining after welding is difficult.

You might want to consider explosives for in-the-field welding. And "Certainly under the vacuum conditions existing in outer space . . . one could visualize the advantages of welding structures with light-weight compact strings of explosives rather than with heavy or bulky electrical or gas welding systems," says Dr. L. Zernow, director of research, Aerojet General Corp.

What Happens — What is the mechanism of explosive welding?

Theoretically, if two clean metallic surfaces are placed in perfect contact, cohesive forces between the atoms should hold them together.

However, metals are almost always polycrystalline; and surfaces are irregular. It would seem, then, that a high pressure causing the surfaces to slide over one another, thus eroding the irregularities, would bring the surfaces into closer contact.

Swirling Metals—One convenient way to do this is to project the two pieces to be welded at each other so that they impact at high velocity.

The photomicrographs show what happens. The metal at the interacting surfaces produces a swirling effect called surface jetting.

Result: A strong weld probably due to mechanical interlocking. It's similar to accidental welding which often occurs when too large an explosive charge is used for forming and sizing sheet metal.

Orient Test Metals—The linecuts point up a simple test arrangement used by Dr. L. Zernow's group at the Ordnance Div., Aerojet General Corp., to determine the parameters of explosive welding.

Two metal plates are oriented at a certain angle. Their outer surfaces are coated with thin layers of explosive which are set off simultaneously.

As the detonation waves proceed along the explosive layers, the plates impact against each other at high relative speeds. Surface jetting and welding occur.

Other Parameters—The behavior of a system depends on a number of parameters. Included are: plate thickness, explosive thickness, the included angle, B, and the length and width of the system.

Other variables include the type of explosive, metal properties, and the effect of a buffer material.

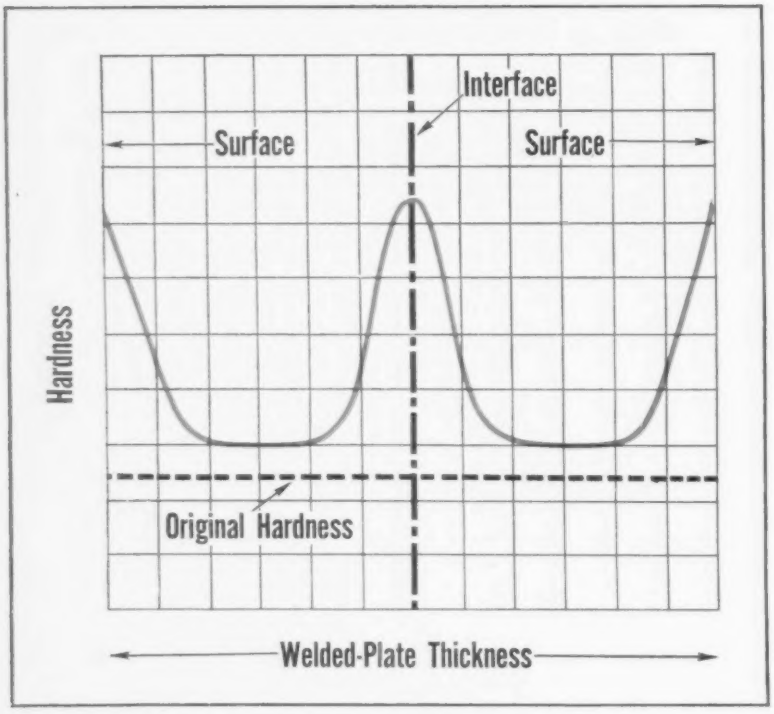
"In actual practice," says Dr. John Pearson of the U. S. Naval Ordnance Test Station, China Lake, Calif., "the geometry of the metal explosive system will vary depending on the parts to be welded. For end welding two pieces of steel tube, for example, the system might consist of a metal-explosive collar wrapped around the prepared ends of tubes.

"In some operations, the parts to be joined may be welded directly together. In other operations, a separate metallic liner may be welded across the interface of the two parts. In practice, a large variety of operations appear to be feasible. All it takes is some imagination and ingenuity."

Angle Is Vital — The angle at which the pieces impact is vital to explosive welding, points out Dr. Pearson.

Suppose the parts are placed in direct contact, as with two flat parallel plates, and subjected to normally applied leads. Then, only

Hardness Profile Gives Clue



HARD INTERFACE: With many explosive welding operations, the interface hardness is equal to, and sometimes greater than, surface hardness.

a minor amount of plastic interaction is apt to occur between the surfaces. Result: a bond of relatively low strength.

If impact velocities are too great, bonding between the parts will be sporadic and welding may not occur.

If velocities are too low, no interaction will occur at the interface. Between these two extremes is a velocity region within which plastic deformation and surface jetting occur.

Interface Can Be Wavy — Different types of welding interfaces may result, adds Dr. Pearson. The wavy appearance in the first photo is one type. Total height from crest to trough varies with the parameters of the system. It ranges from about 0.005 to 3/16 in. for different welds. Wave length varies from about 0.010 in. for small values of B to about ¼ in. for large values of B.

This wave effect can be minimized. Varying the parameters of the system can produce a fairly straight weld as in the second photomicrograph.

Note that the grain structure near the welds undergoes a large amount of plastic deformation. A hardness profile usually shows a peak near the interface.

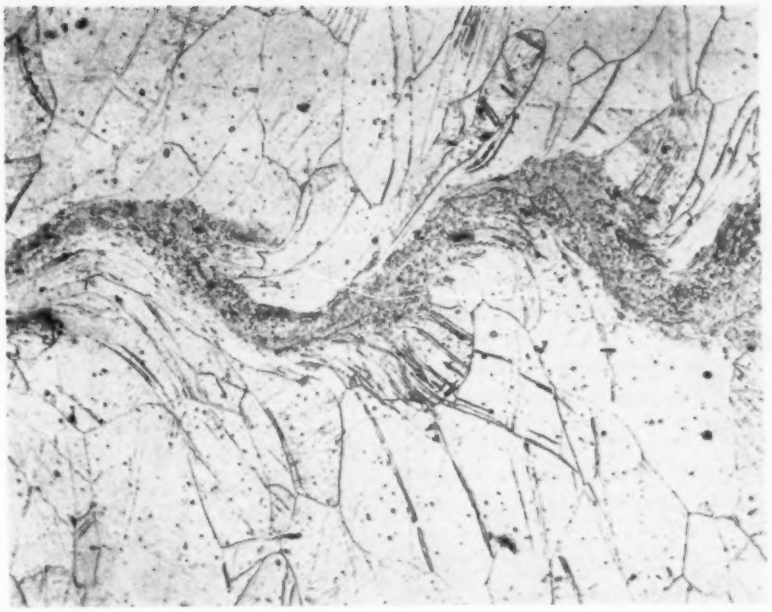
How About Strength? — Shear and tension tests show that the metal normally fails through the parent metal adjacent to the welded interface rather than through the actual weld.

Other tests show that the strength in shear is at least equal to the strength of the parent metal. However, weld quality depends upon the design of the system.

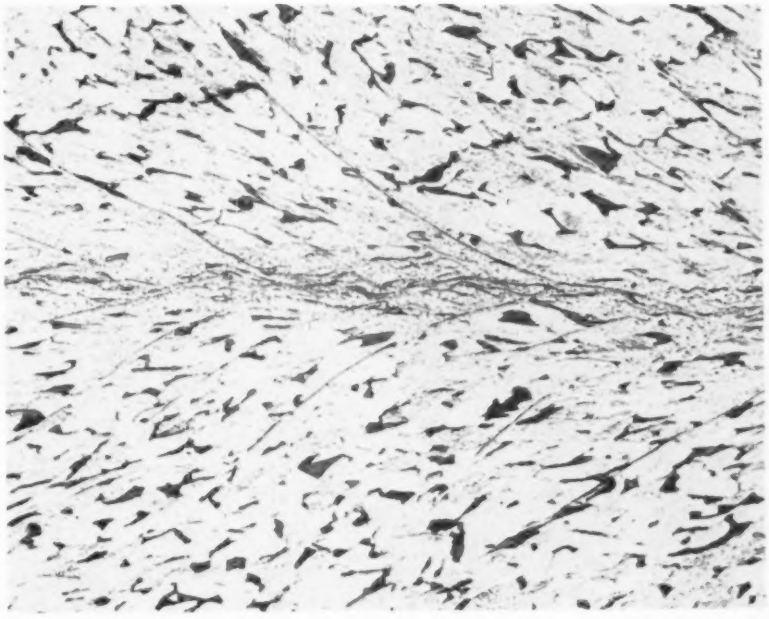
Standoff and Contact — Both standoff and contact operations may be used when explosive welding, says Dr. Pearson. "Standoff" is when the explosive is some distance away and the energy is transmitted to the workpiece through a medium such as air, oil or water.

"Contact" is when the explosive is in intimate contact with either the workpiece or a buffer.

Because the contact method gives the higher pressures, it's generally used for welding bulk parts and plates. Short standoff operations are suitable for foil, sheet or thin metal plates.



SEA OF METAL: Wavy appearance of surface jetting is normal with one type of weld. Wave length varies with B, the angle between the plates.



LESSEN WAVE EFFECT: Varying the system parameters gives a fairly straight weld. Note severe deformation in narrow area near weld interface.

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Ask for Reprint **No. 166**

Plant Repairs Get Fast Action With Data-Processing Method

By **W. J. Smith**—Section Head, Plant Engineering Dept., Goodyear Aircraft Corp., Arizona Div., Litchfield Park, Ariz.

Data processing makes sense on plant repair scheduling.

The cost trend throughout the year can dictate your next move—repair or replace.

■ Rising overhead costs force many companies to adopt new methods of processing maintenance records. At Goodyear Aircraft Corp.'s Arizona Div., a simplified data processing system ends manual record posting. The system helps hard-pressed executives to better analyze and evaluate essential information.

The new system may be used by any type of manufacturing operation. It makes possible a complete run on more than 2,500 items of plant equipment each month in only four hours.

Use of data processing equipment for maintenance posting covers three basic steps: Assign numbers to "all equipment," assign operation numbers to all maintenance functions; and tabulate results by month. The equipment then sorts, tabulates and records the information reported by maintenance employes on their daily time cards.

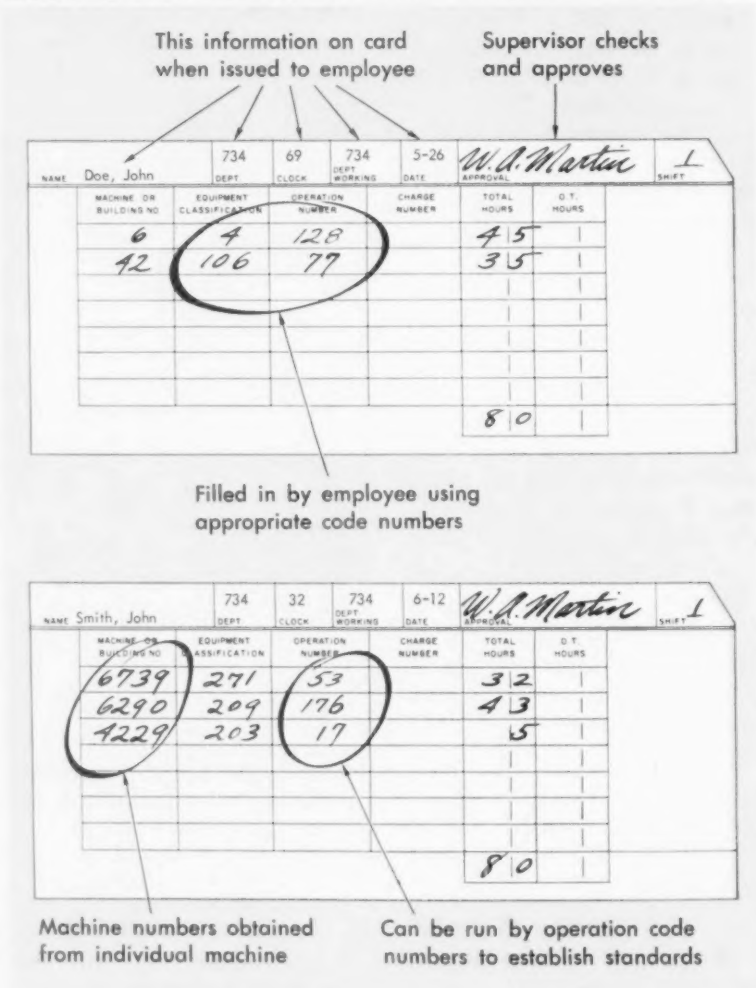
How To Establish—The code numbers must fully describe the maintenance function. The complete code number is composed of the machine or building number, description of machine, or building component and description of work done.

Each maintenance man lists the code numbers on his daily time card. Key punch operators punch the information into IBM or equivalent cards and, after sorting, a report listing the work on each machine is published at periodic intervals.

The first step calls for all buildings, machines, tanks, vehicles, in fact, every item of the physical plant, to be assigned a number such as, building (6) and tank (6739). Once established, they serve as the first and location number of the maintenance code.

Don't Confuse—Some operations not specific to a building or ma-

List Job Codes on Time Cards



KEEPING TRACK: Typical time cards are coded to indicate the work performed during the day. These data are then punched on detail cards.

chine will be charged to a department. Here, to avoid confusion, department numbers should not appear as part of the code numbers.

The second number of the complete code number is a general description of the item or, for buildings, a description of the building component. Typical examples would be (4) floors, (273) plating, (271) anodize or (172) fork trucks. Units that have some relation should reflect it in the code scheme used.

The third code number is a detailed description of the work done on the equipment or building. Job operations should be listed by crafts and handled with the maintenance supervisors so as to include all jobs. Here, typical numbers could be (53) repair leak or (128) hand sweep.

The number of digits in a code number is dictated by the capability of the data processing unit, the degree to which each job or machine is broken down, or the quantity of numbers which maintenance personnel can use effectively. Up to 400 numbers in each category, except machine numbers, can be successfully used.

Set to Code—With the numbers established, work coding the individual jobs is simple. For example, repairing a leak on an anodizing tank on June 12, by employe number 32, of Department 734 required 6.2 hours. This would be coded as: 6739 271 53 734 32 6 12 6.2.

The time cards in Fig. 1 are coded to show the work performed by two employees during the day. Note that space is provided for a charge number. This provides for collecting charges by work order of repair order as well as by machine or equipment.

The data reported on the individual time cards are punched on detail cards. After sorting and tabulating, a report as shown in Fig. 2 is prepared automatically. Reports, prepared with one machine or building per sheet, facilitate filing.

The machine equipment folder, where all reports are filed, should be coded to indicate, with colored tabs, the next inspection and lubrication dates. The folder should also have complete information on the machine such as part prices and source of supply.

Better Control—Tabulating maintenance data reduces cost and improves control. Manual recording of maintenance operations involves high clerical cost plus the possibility of error during the transcript of records.

Reference to past inspections and repairs provides a historical basis for setting exact inspection periods. If the records indicate no repairs during the past year, then it is obviously not economical to inspect the machine weekly or monthly.

High maintenance cost items are readily apparent with the data supplied from processing equipment. The monthly report will provide the time spent on any particular machine. This time, multiplied by the labor rate, plus the part cost, will give total maintenance cost.

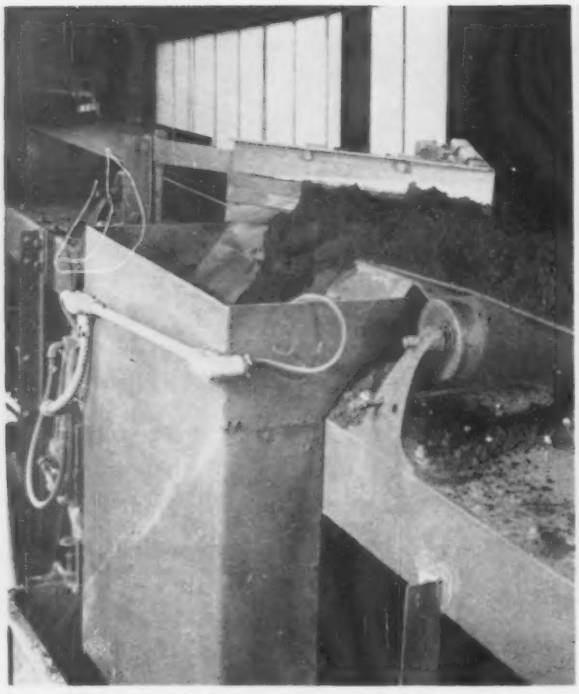
The trend of this cost compared to the cost of overhaul or replacement will provide a basis for decision—replace or overhaul.

Recorded Data Build Story

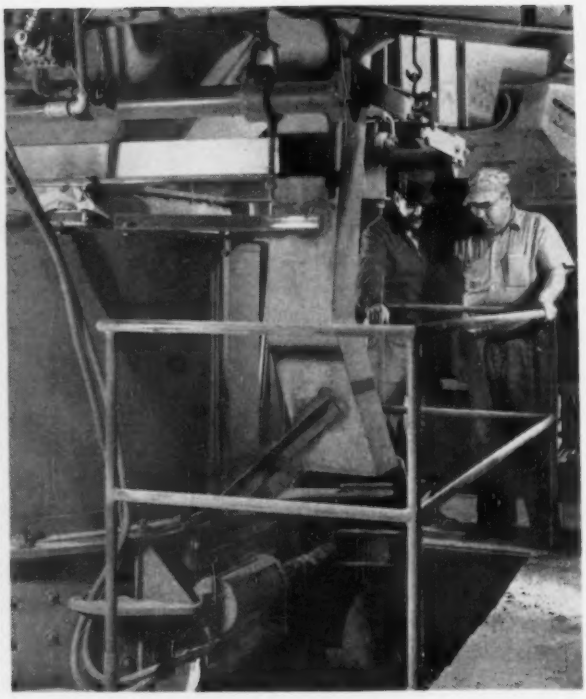
MACHINE OR BUILDING NUMBER	CLASS OF EQUIPMENT	OPERATION NUMBER	MAINT. DEPT. NUMBER	EMPLOYEE NUMBER	DATE	HOURS	
1	11	257	734	66	1 18	8.0	
1	11	257	734	66	1 6	2.0	
1	11	257	734	66	1 9	4.0	
1	11	257	734	66	1 11	2.0	
1	11	257	734	66	1 3	8.0	
1	11	257	734	66	1 5	3.0	
						27.0	*
1	15	249	734	66	1 16	1.5	
1	15	249	734	66	1 9	4.0	
						5.5	*
1	37	258	734	88	1 23	2.0	
						2.0	*
1	43	258	734	85	1 27	1.0	
1	51	18	734	85	1 28	1.0	
1	51	18	734	41	1 21	1.0	
1	51	18	734	85	1 21	1.0	
1	51	18	734	85	1 8	1.0	
1	51	18	734	85	1 15	1.0	
						5.0	*
1	51	26	734	4	1 26	1.0	
1	51	26	734	4	1 31	1.0	
1	51	26	734	4	1 18	1.0	
1	51	26	734	85	1 13	3.0	
						6.0	*
1	51	241	734	85	1 25	1.0	
						1.0	*
1	51	258	734	85	1 16	3.0	
1	51	258	734	85	1 6	1.0	
						4.0	*
1	106	259	734	31	1 9	1.0	
						1.0	*
1	108	77	734	31	1 23	1.5	
						1.5	*
1	123	55	734	4	1 25	1.0	
1	123	55	734	4	1 29	1.0	
1	123	55	734	4	1 30	1.0	
1	123	55	734	85	1 31	1.7	
1	123	55	734	4	1 19	1.0	
1	123	55	734	85	1 18	1.0	
1	123	55	734	4	1 8	1.0	
1	123	55	734	4	1 13	1.0	
1	123	55	734	88	1 4	1.0	
						9.7	*
1	123	56	734	85	1 26	2.0	
						2.0	*

* Total Hours

MAINTENANCE PICTURE: This report, tabulated automatically by a data processor, tells at a glance the repair that was made and the time used.



SAND PLOW: Automatic plows, operated from hopper probes, divert the sand into the proper areas.



OPERATION AUTOMATIC: Controls in the muller take care of pre-weighing, charging and discharge.

Steel Foundry Adds Sand Mixing To Program of Automation

It takes time to put foundry operations in the hands of automation. Done properly, the rewards are worthwhile.

Higher quality castings can be produced at lower costs.

■ Operations in a steel foundry can gain a lot through automation. Automatic control of sand mixing, distribution and reclamation adds up to faster operation at lower cost. It also results in castings of improved quality.

This final step in plant modernization serves as the climax to a 10-year program at Empire Steel Castings, Inc., Temple, Pa. The new system was installed under the direction of Edwin S. Carman, Inc., Cleveland.

What are the main benefits derived from such a system? First of all, the factor of human error is reduced to a minimum. Also, the uniformity of sand makeup for cores and molds has improved casting quality and cut rejects.

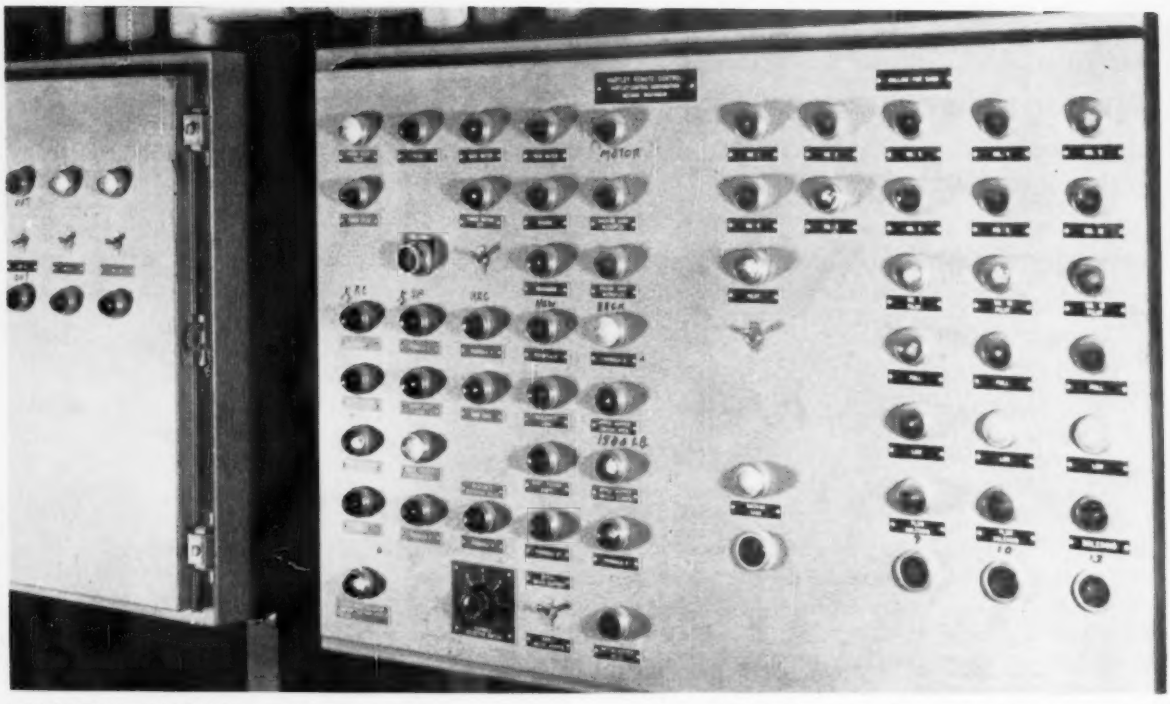
Dust concentrations have been cut way back, and costs have been reduced, too. Sand use, according to H. L. Kurtz, chief plant engineer at the foundry, has been shaved to less than one-third of prior needs.

First Step — New sand is first stored in 500-ton silos. When needed, it's then fed into a central batching hopper. Also feeding into the hopper at the same time are reclaimed sand, shake-out sand, bentonite and miscellaneous binders. Mixes are then made according to preset formulas.

After weighing, the mixed sand is distributed by automatic conveyors into the required molding station hoppers. Probes in each hopper signal the mixture control center to shut off the flow once the hopper is filled. Automatic plows go to work distributing the sand into the proper areas.

The present shake-out system is equipped with a new type of grating to prevent the passage of chills through the deck. This portable shake-out unit serves a number of molding lines.

A belt conveyor takes the shake-



MASTER CONTROLS: From this station, preset sand mixes can be selected. System also routes delivery of sand to required hoppers. All sand mixes are made in accordance with predetermined formulas.

out sand into a 60-ft vertical bucket, then discharges the sand over a magnetic pulley chute into the cooling cascade at the rate of 35 tons per hour. The upward flow of air in the cascade further speeds the cooling by pulling the fines into the collector. These fines are discharged right into the elevator boot.

Reclamation — Clean shake-out sand is fed from a silo into a pneumatic, dry-type sand reclaiming unit. This unit can reclaim used steel foundry shake-out sand for reuse in mold-facing mixtures on the order of three tons per hour.

At this rate, oxidized binders present during shake-out are removed. And this is close to 50 pct of the original binder content. The grain distribution pattern is adjusted to conform with that found in the original as-used sand.

One feature of reclamation is that it reduces the amount of fresh bonding materials that must be added to the sand mixture. In other words, since 50 pct of the initial bond is still present in the reclaimed sand, only 50 pct of the "new sand" additions are required.

Word From the Wise—The workers report a preference for reclaimed sand. They say that it flows better than new sand and that it produces better molds in less time, too.

Reclaiming is done by making the sand grains sandblast one another. Used sand, returning from shake-out, is intercepted and passed through a screen. Acceptable material moves onto the scrubbing unit; oversize material is discarded.

Screened sand is reclaimed to the desired quality level and is subjected to final screening to remove pieces of slag, scale and metal shot. Undersized material is removed by the pneumatic action of the dust-collection system. Usable sand passes to the discharge hopper where it's pneumatically fed to the top of the storage silo.

New Controls—There's an automatic control system built into the high-speed muller. This system covers every step and cycle including moisture, automatic starting and stopping, and full interlocking with the rest of the system.

Two individual circuits are used. One is for backing sand; this accounts for about 80 pct of the batches.

The second circuit is for facing sand. The moisture controls are pre-set on an individual circuit but operated on a job basis. The circuit also permits handling of extra bond additives as well as dispatching binders manually weighed out and dumped into a separate feeder.

When handling facing sand, the muller operator selects the circuit for the desired formula. This provides automatically the bentonite plus required weight of backing, reclaimed and/or new sand. The operator loads the miscellaneous bonding material by hand.

From there on, the cycle is fully automatic. The built-in controls supervise the feeding of sand, temperature control, water and binder additions, and other muller operations. The setup adds quality and efficiency to foundry output.

Conveyors Link Forging Line

Chrysler Devises New Scheme to Shape Volume Parts

The practical approach to modern production requires more and more engineering sense.

In forging, you must get the most out of two factors: time and temperature.

By **R. H. Eshelman**
Machinery Editor

■ Make one part replace two and there's a good chance that production costs will drop. Try this in forging and you have a man-sized job on your hands. Forging experts at Chrysler Corp. achieved that goal and they improved materials handling to boot.

The parts in question are the steering knuckle and support. Two sets of these parts go into every car, so you can see that their annual production gets up into the millions.

Brawnpower — To keep these parts flowing, 15 steam hammers, lots of muscle and blacksmith skill were taxed to capacity. Also, as soon as the parts left the hammers, a steady stream of trucks and tote boxes shuttled back and forth from building to building for heat treat, cleaning and gaging.

Now there are three press-forging lines which replace the former batch-processing system. And the new lines are geared to modern, high production. J. M. Smith, plant manager of the Chrysler Forge Plant at New Castle, Ind., points out: "Now it's much easier to control part quality; we can hold our tolerances much closer.

"Also," Mr. Smith adds, "we don't have to worry about gaging 100 pct for straightness because the final hot press-straightening operation hits virtually every piece right on the button."

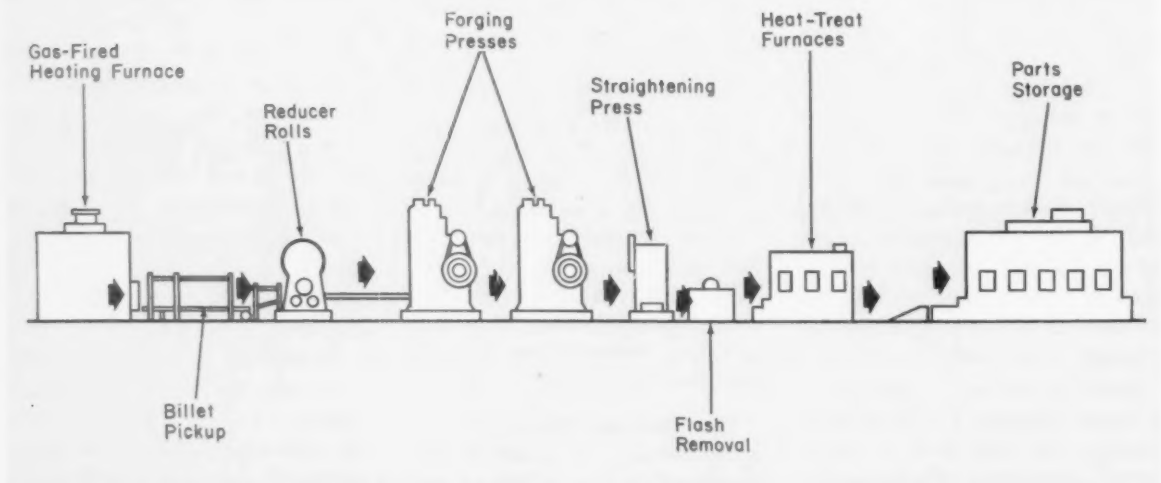
Continuous Handling — A big feature of the new system is an in-line conveyor which begins at the point where the bar stock is sheared and continues straight through to final cleaning.

A conveyor brings bar stock (1046 steel) in from the yard. It is first sheared to length, then dropped onto a conveyor where it is fed to an automatic loader. As soon as the loader locates gaps in the rotary gas furnace, it feeds in the blanks. There they are heated to forging temperature.

At the press of a button, a shuttle arm automatically lifts the blanks (one at a time) from the furnace. The shuttle arm then drops the blanks onto a high-speed conveyor. This conveyor carries the blanks to the forge line proper.

Down to Size—First stop for the heated blank is the reducer roll. Here the 26-lb blank is broken down to bite size. This is done in two passes. Then the necked blank is conveyed to the first forging press.

Modern Line Keyed to Volume



FORGING SEQUENCE: First stop for sheared bar stock in the forging line is the furnace, where it is heated to forging temperature. After final heat treat, parts are machine cleaned and then inspected.

This press performs a three-step forging operation within closed dies. First, the blank is cut in two. Then each part is blocked to length. The third operation trims off the flash.

Trim drops out the side of the press onto another conveyor where it's removed from the line. The workpiece, on the other hand, drops onto still another conveyor which delivers it to the final forging press.

End of the Line—At this final forging station, part forming is completed in a two-step die. From here, the part is moved to a trim press, then onto storage for cooling before being loaded into the heat-treating furnaces.

After heat treat, the part is conveyed to the straightening press. The final stations include cleaning, inspection and shipping.

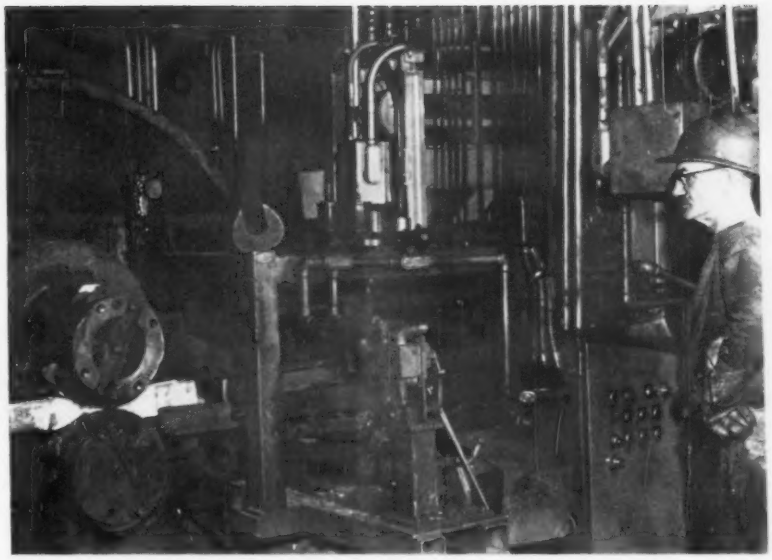
The three separate press-forging lines include three heating furnaces, three reducer rolls and six forging presses. The three forge lines channel the parts into two furnaces, one for hard quenching and one for drawing. There are also two straightening and finish lines.

Direct, mechanized parts flow means a huge savings in the area of in-process handling. Thus the heavy investment in mechanical handling systems is paying off in many ways. One is the reduction of parts on processing, while another is the boost in output per unit of labor. Part quality has improved, too, and less floor space is used.

Now just one man is in charge of the shears. Operators are also on duty at the rotary furnace and reducer roll. There's a forge operator at both the blocking press and the finishing press.

You'll also find one man at the trim press, while still another supervises the heat-treat setup. Both the straightening press and the cleaning machine are manned, too.

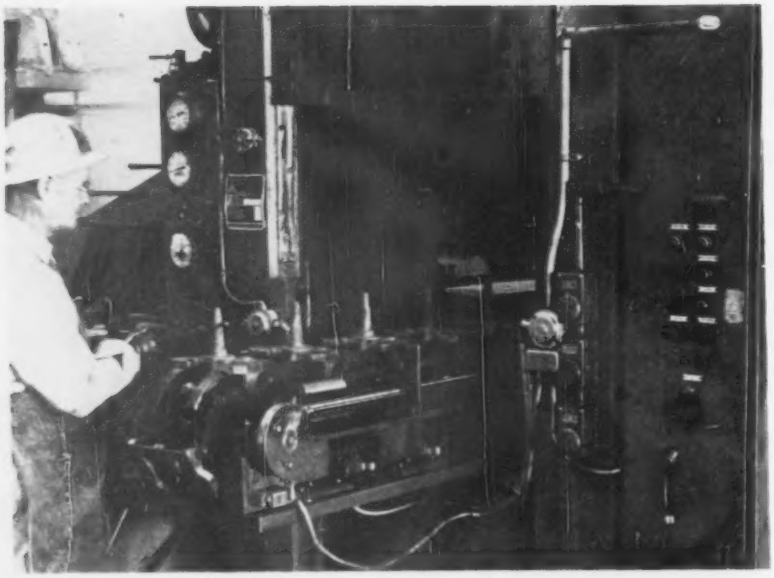
Many equipment problems had to be solved before the line went into operation. Chrysler engineers focused on the forging presses as a starting point. It was obvious that



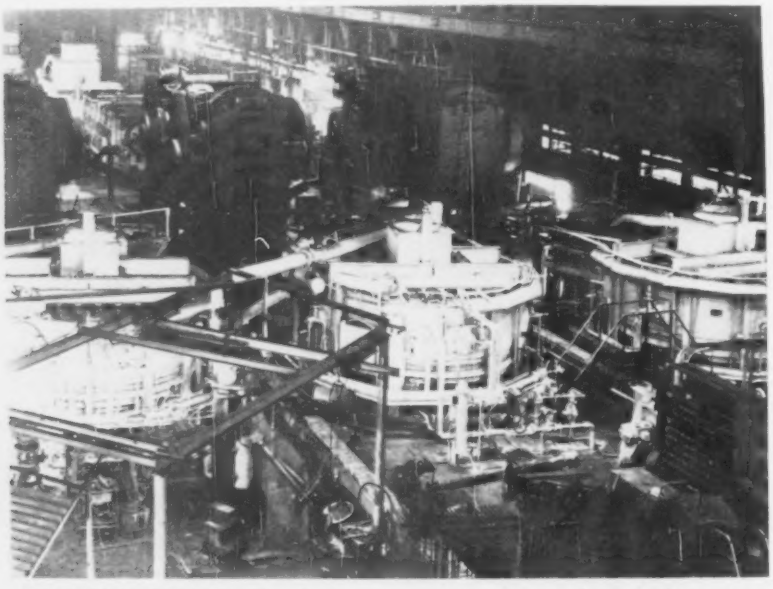
BACK AND FORTH: Reducer roll, pushbutton controlled, fashions billet in two passes before sending it along the conveyor to the first press.

New System Achieves Forging Quality

CHANGES IN SHAPE: As-sheared bar stock is first necked in reducer rolls. It then receives three die dimensions in National press. Final die impressions are performed in a mechanical press.



HOT SIZING: As soon as the forged parts come out of the draw furnace, they go through hot sizing. Parts are then cleaned by shotblasting.



THE BIG PICTURE: The three separate press-forging lines include three heating furnaces, three reducer rolls and six forging presses.

a reducer station was needed ahead of the blocking press to size the initial bar down to a manageable billet.

Low Cost — The engineers then found out that the most economical method of heating the bar would be in an automatic loading, gas-fired rotary furnace. Using templates and models for layout, they included mechanical handling equipment between the units.

Perhaps the biggest problem concerned time. Once that blank has received two passes through the reducer rolls, it must be delivered to the forge line without losing its forging temperature.

If the blank loses too much heat before it reaches the finish press, you either lose die life or fail to make a good part. For these reasons, the presses have been located as close as possible to the rolls and furnace.

Tests Pay Off — Of course, the fact that the part could be press forged at all was the real key to the new installation. The mechanized line didn't get on the drawing board until much die work and experimentation had been spent on the presses.

The trick in successful press forging is to limit the amount of metal movement in each impression. You must use enough steps to do the job easily. After making the forging for several years, Chrysler engineers were able to devise methods to forge the difficult arms, using a vertical position in the die.

A problem in handling arose between the trim press and the heat treat. The part is trimmed at 1800°F. However, it must be under the critical temperature before it goes into the hardening furnace. As a result, each part needs time to cool.

Had to Compromise—Engineers wanted to keep the part in the mechanized system at this point to avoid costly manual handling. A compromise was reached, mainly due to part mix and other mechanical considerations. So the hot forgings are now loaded into skid boxes where they cool.

Forgings are then scheduled into either of the two heat-treat lines. The parts are loaded into hoppers which feed to the furnaces.

Flash scrap from both forging and trim presses is carried in woven mesh-type conveyors. The same type of conveyor along with drag types are used at the discharge end of the draw furnaces. These setups haul the parts to the straightening press.

This type of transfer for these locations pays off on two counts. Studies show that one benefit is initial cost. The other is maintenance during operation.

Bearing Simulator Plots Design

Bearings used on many jobs call for a precalculated life.

One company uses its new bearing simulator to provide quick answers on the bearing and its lubricant.

■ A unique research tool called a ball bearing simulator assures big gains in the design and performance of ball bearings.

Sperry Gyroscope Co., Great Neck, N. Y., claims the unit reproduces the major characteristics of ball bearings and simulates life tests in only one-tenth of the time normally required.

The device has opened the way to quick, but comprehensive, evaluations of a multitude of lubricants and contaminants. Each material is checked for its effect on bearing life.

Quick Check—The Sperry machine is a table-top device enclosed under a sealed glass cover. It simulates such bearing traits as operating temperature, atmosphere and ball-to-race contact pressure and surface speed. Other traits are roll-to-spin ratio plus the amount and type of ball lubricant.

Prior to the development of the Sperry machine, lengthy and costly bearing "spindle" tests, or run-to-failure tests were the only methods for determining the life of a bearing.

Simple, low-cost construction makes the simulator attractive. Its parts are easily produced with simple machine tools. The race or ball track surfaces are flat, and can be exactly duplicated as often as needed.

Many parts can be refinished and used over and over again. Also, the simulator's race and ball cage assembly can be dismantled quickly to view or photograph materials under test.

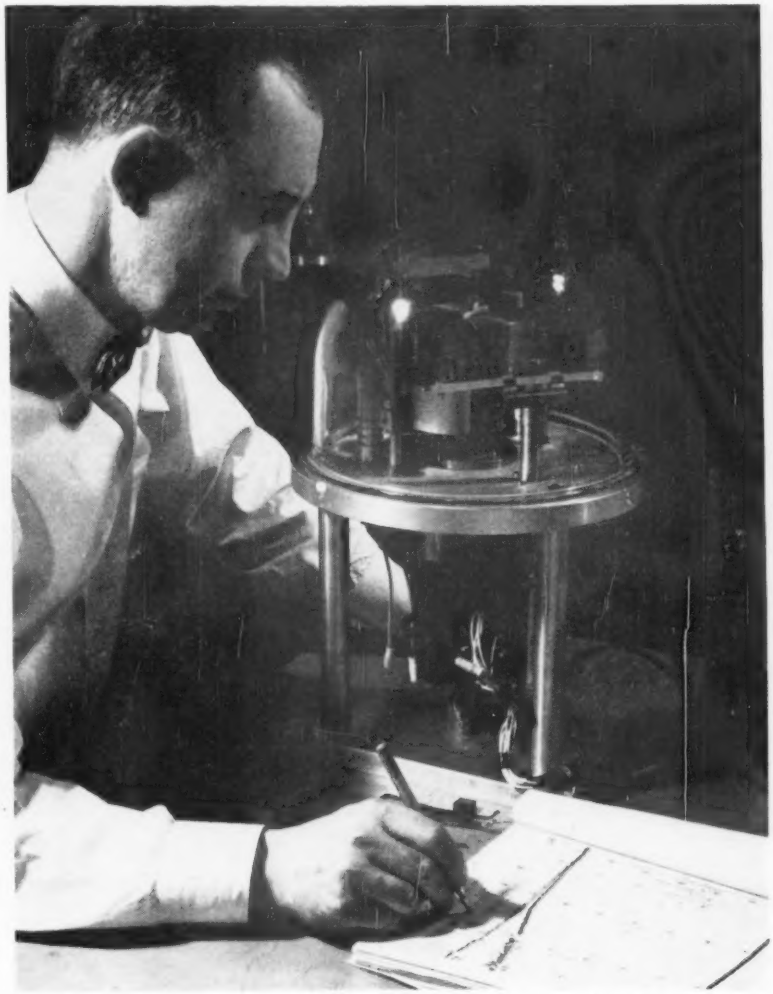
Finds Uses—Sperry already has employed the devices in bearing investigations for a Remington Rand Univac computer memory drum. It also assists on an inertial guidance gyroscope produced for the Air Force B-58 Hustler supersonic jet bomber.

Three Sperry simulators are believed to be the only machines of their kind in existence. They are presently able to duplicate the performance of any high speed, high temperature, low lubricant bearing.

Improvements in the simulator promise effective use of the test device for a much broader range of industrial bearings.

Although the ball bearing simulator was developed primarily to solve in-company bearing problems, Sperry said that other manufacturers and at least one military agency have shown interest in the simulator's capabilities.

A few of the unit's immediate uses include miniaturized gyroscopes, motors and computer memory drums.



QUICK ANSWERS: Sperry simulates bearing life tests in only one-tenth the time required for normal run-to-failure checkout. The unit duplicates the performance of any high speed, low lubricant bearing.

High-Speed Machining Triggers Output of Nonferrous Parts

The demand for nonferrous parts makes high-speed machining a real production method.

Here are several points that will help you appreciate the full value of this process.

■ Certain industries have been using high-speed machining methods to shape nonferrous metals for years. Others have yet to be indoctrinated. If you're involved in volume production, then high-speed machining is worth looking into.

About 20 years ago, Onsrud Machine Works, Inc., Niles, Ill., began building tools designed on the high-speed machining concept. Present models in the Onsrud line have come a long way from those of the early forties.

A good example is the company's Tri-Way Mach-Mil. This unit, as run by a single operator, can mill up to three sides of a piece in one pass with one setup.

Varied Uses — Onsrud officials report that many companies are now using high-speed machining techniques to make nonferrous parts. Such products as valves, pumps, carburetors, outboard motors and appliances are commonly produced by this method.

In fact, airframe builders have found the method so beneficial that it's now reported to be a standard method throughout this industry.

As applied to nonferrous metals, just what is high-speed machining? Can it be defined? Yes, it can. In this process, you'll find a range of cutter speeds from 5000-10,000 sfpm. Of course, it depends upon the diameter of the cutter in use, but, to reach these speeds, spindle speeds of 1800-100,000 rpm are employed.

Naturally, the higher the cutter speeds, the higher the feed speeds needed to maintain a given chip load on each tooth of the cutter. This factor is demonstrated clearly in the graph. This example is based on a 6-in. diam, 8-tooth cutter running at 3600 rpm. At this speed, it will be cutting a chip 28,800 times per minute.

Direct Proportion — You'll note that a feed speed of 28.8 ipm is required to achieve a chip load of 0.001 in. per tooth. The proportion works up to a feed speed of 288 ipm to get a chip load of 0.010 in. per tooth.

Maximum chip thickness depends upon the surface condition desired and the capability of the machine and its tooling. Here, rigidity and horsepower are prime factors.

This high frequency of cutting chips obviously results in a high rate of metal removal. Although there are certain limitations, the process is clearly a high production tool.

Tool Life—Isn't tool life critical in high-speed machining? It certainly is, but cutters can be designed to provide life equal to, or better than, cutters made for conventional feeds and speeds.

Many variables affect tool life. Nevertheless, it's best to measure

VOLUME PRODUCTION: High-speed techniques can be used to machine a variety of nonferrous parts.

tool life by the number of pieces produced per grind, not by the length of time that the cutter runs. Production is one thing; time is something else.

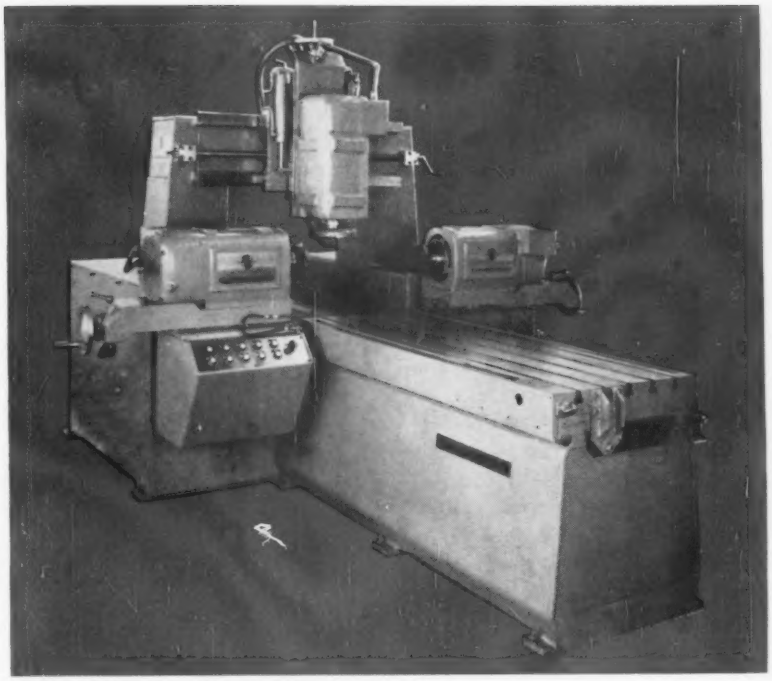
Try to think in terms of the production life of your tool. At the same time, spend a little more money for cutters and a little more time on their care and grinding.

Do Chips Weld?—Potential users voice concern in high-speed machining as to whether the chips tend to weld onto the cutter. At Onsrud Machine Works, Inc., engineers see no reason to experience this problem in machining aluminum.

What happens is this: Heat develops between the cutting edge of the cutter and the chip being removed. This heat, the engineers point out, is removed almost as fast as it's generated. In other words, when you machine at high speeds, your cutter is turning up to 10 times faster than at conventional speeds.

As a result, a much smaller chip load per tooth is taken. This reduces the amount of heat generated, while still maintaining faster speed feeds than are obtained by other methods.

Although the lighter chip load does reduce the heat problem, that's not the main reason for the absence of heat in high-speed machining. It's actually the short time of contact between chip and cutter. The cut is taken so fast that the chip hardly gets a chance to transfer its heat into the cutting edge before it's thrown clear.



THREE-WAY APPROACH: With this unit, it's possible to mill three sides of a piece in one pass using a single setup. One operator can do it.

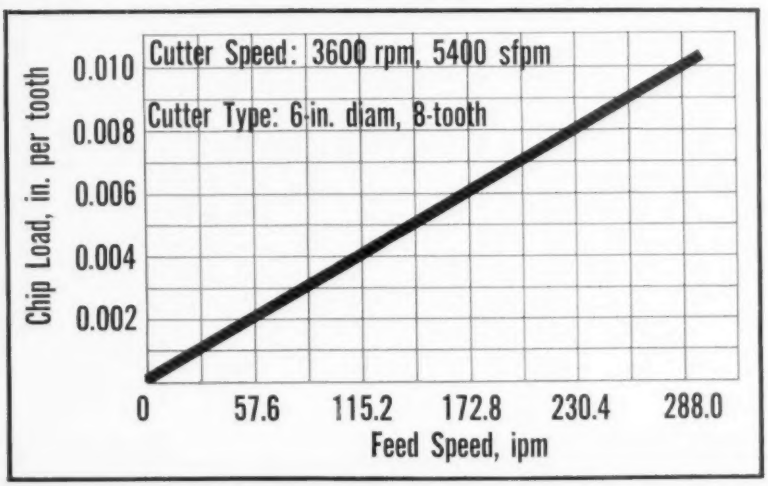
Heat Transfer—When cutting at slow speeds, the chip stays in contact with the cutting edge of the tool much longer. The contact time is long enough for the chip to transfer its heat into the cutting tool itself.

The coolant also plays a major role in ridding the heat problem and extending tool life. What really matters is the way in which the coolant is applied, not the amount used or the type of coolant.

Coolant should be applied where it will do the most good, and that's on the cutting edges of the cutter. Just a thin film of coolant is all you need to reduce the friction of the chips sliding over the face of the cutting tool. The coolant also acts as an insulator during the cutting process by reducing the heat transfer from chip to cutting edge.

The coolant should be sprayed onto the cutting edge of the cutter from several points around the outside of the cutter. Small high-pressure jets can be most effective. In this manner, a fine spray can be applied at high velocity which will penetrate the turbulent air created by the cutter when running at high speeds.

Feed Governs Metal Removal



New Crane Has "Walk-In" Girder

Overhead-traveling crane designs take on a 'new look.'

Radical departures from old concept result in more versatility, less and easier maintenance.

■ Overhead traveling cranes are in for a major design change—the first in 74 years. Harnischfeger Corp., Milwaukee, claims today's profit picture depends, in part, on top notch handling equipment. With this in mind, the company's industrial division put into effect radical design changes on its overhead cranes.

Improved electronic parts and a pressurized 'walk-in' passageway make the entire concept possible. The most obvious change in the new walk-in crane is the main girder. Its hollow interior houses strategic controls and power components. Their location lends to easy servicing.

Long Aisle—The crane's interior aisle, 8 ft high, 5 ft wide, extends almost the full length of the 120-ft girder.

The aisle or passageway is pressurized similar to the cabin of an airliner. The pressure protects the electronic controls against many harmful outside atmospheres in which the crane often must work.

A small, but powerful blower pressurizes the girder by forcing clean air into it. A self-cleaning wool bag serves as the filter.

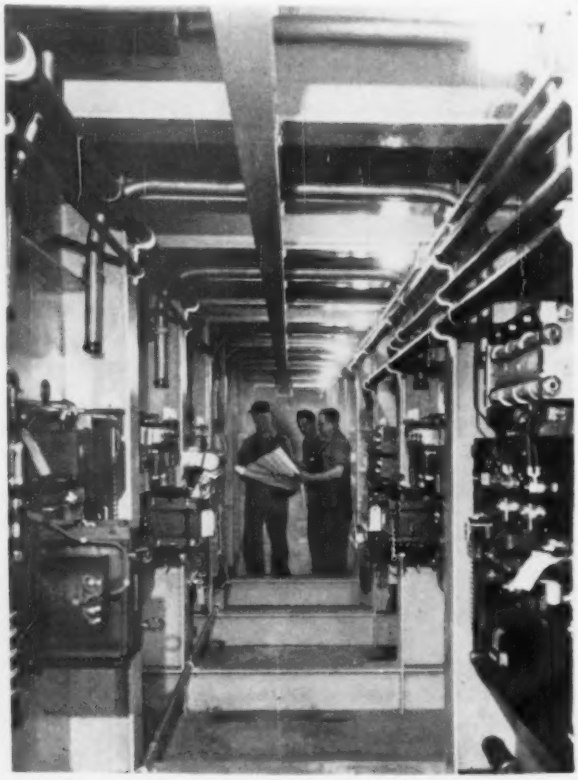
Pressure held about 2 lb above normal is ample to prevent dust seepage. The pressure also protects against excessive heat buildup from components within the girder.

Many Uses—Steel mills, copper smelters, bulk chemical plants or dock side operations are subject to corrosive or abrasive atmospheres. The new design prevents the various atmospheres from playing havoc with electrical relays, contactors, and other sensitive components.

Girder maintenance is simplified by the new design. Crews can now make their checks or repairs in the safety and convenience of the passageway. All electrical panels and control equipment are mounted against the interior walls for ease of entry.

A high-capacity electric hoist handles any heavy equipment inside the girder. It also elevates tools through a dust-proof hatch.

One company official claims that half the economy of the new design is a result of being able to eliminate "auxiliary gingerbread."



DESIGN CHANGE: The overhead traveling crane includes a pressurized passageway inside the main girder, running almost the length of the crane. The area reduces maintenance costs while increasing safety.

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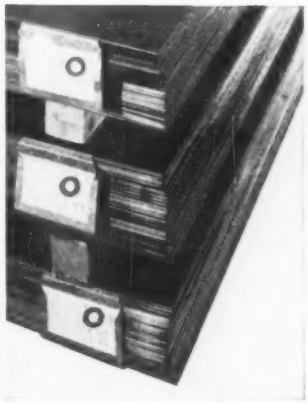
When you discover a soft spot in your steel stocks, ask Acme-Newport for their *Red Circle Service* on your fill-in order. Such orders really burn their way through this place, for every man has explicit instructions to give them preferential handling from order desk to loading dock. Modern facilities, conscientious personnel and the flexibility of an operation this size, permit exceptional service combined with strict adherence to your specifications and the quality standards of this 76-year-old basic steel producer. So when you need good steel *fast*, call for *Red Circle Service*.



Acme-Newport Steel COMPANY
NEWPORT, KENTUCKY
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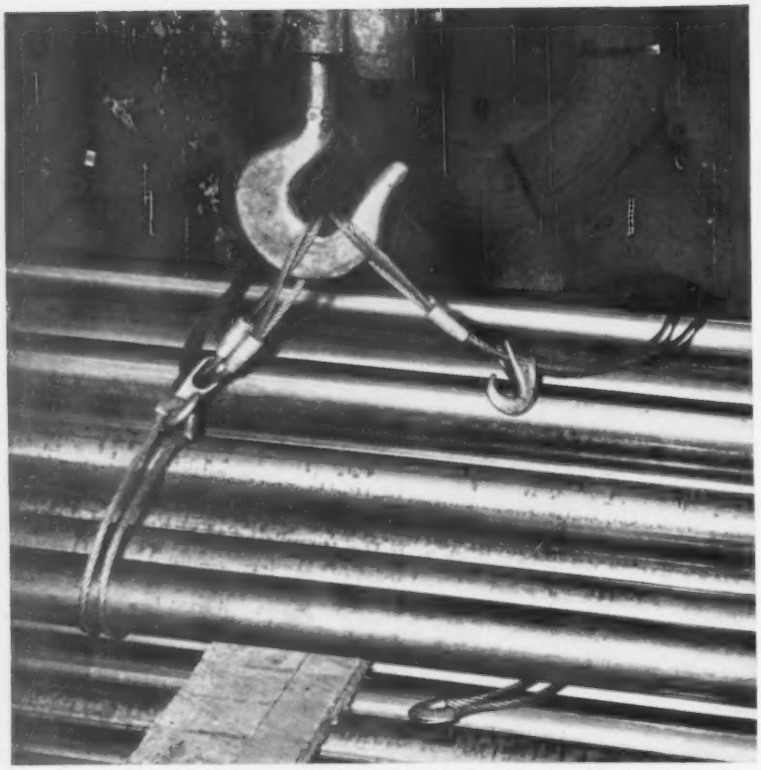
Hot Rolled Sheets	Alloy Sheets and Plates	Electric Weld Line Pipe
Hot Rolled Pickled Sheets		Spiral Welded Pipe



Close up of sling specially designed for Tex-Tube showing quick-disconnect feature. Traveling choker hooks can be pulled off crescent thimbles once the load of pipes has been lowered. Sling can then be easily removed from under the load with minimum of load damage.

TEX-TUBE'S method of pipe handling improved with CF&I-WICKWIRE SLINGS

Handspliced slings that are used to "choke up" long, heavy loads of pipe have a tendency to unlay as they are pulled out from under the load.

Tex-Tube, in cooperation with CF&I-Wickwire's Houston Sling Shop, came up with an entirely new sling assembly, (pictured above), which provides a quick-disconnect feature without the disadvantages previously encountered.

Art Pitkin, Tex-Tube Purchasing Agent, says: "This sling improved the safety of our pipe-handling operations and reduced the possibilities of marking the pipe. We've been using it successfully for several years."

CF&I-Wickwire can help solve *your* sling problems. For details on our complete line of standard or custom-designed slings and wide range of sling assemblies and fittings, send for your free copies of Folder WR-729 (Wire Rope Slings) and Folder WR-744 (Swing Slings).

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NEW PATENTS

Gray Iron Castings

Method of graphitizing cast iron, R. H. T. Dixon and J. H. Gittus (assigned to International Nickel Co., Inc.), Mar. 7, 1961. In the production of an improved gray iron casting, the molten bath is cast in a mold and graphitized by vibrating at a frequency of at least 50 cycles per minute. The vibration modifies the hyper-eutectic and eutectic carbides in the casting. U. S. 2,973,564.

Coats With Phosphate

Method of coating ferrous articles with phosphate, J. A. Henricks, Mar. 14, 1961. In the formation of integral phosphate coatings on ferrous metal surfaces, a powder comprising zinc nitrate, starch-coated glycolic acid or sulfamic acid, monobasic sodium phosphate, and calcium-phosphate-coated, calcium chloride is added to the bath. U. S. 2,975,082.

Transports Solids

Apparatus for transporting fluidized solids, W. L. Davis, Jr. (assigned to U. S. Steel Corp.), Mar. 14, 1961. A fluidized bed provides the medium for the direct reduction of iron oxide ore. A venturi throat is provided for transferring the solids from a low-pressure vessel to one of higher pressure. Relative height or vessel position has no effect. U. S. 2,975,000.

Lining Inserts:

Relief inserts for metallic lining, R. W. Anderson and C. F. Kamrud (assigned to Reserve Mining Co.), Mar. 14, 1961. A gyratory apparatus, used for crushing taconite or other hard ores, has a collapsible insert in the lining of the upper-mantle section. This permits that section to shrink. Thus, it maintains contact with the lower mantle. U. S. 2,974,889.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Electric Eyes

Background information on the history and development of electric eyes lends interest to the discussion of their uses in automation found in a 22-page booklet. The book is an authoritative reference manual covering thirty years experience with photoelectric controls. It's slanted toward the engineer to assist him in solving specific problems. (Photomation, Inc.)

For free copy circle No. 1 on postcard

Seven Motor Starters

A newly-prepared brochure fully describes a line of motor starters with seven models. It's extensively illustrated, and gives detailed facts on the many construction, installation and inspection features found in the starters. (Allen-Bradley Co.)

For free copy circle No. 2 on postcard

Industrial Plastics

The subject of a new brochure is plastic mill shapes for machining or fabrication on standard metalworking equipment. It treats on the advantages of industrial plastics in stock shapes. New processing and product developments, that broaden the uses of these plastics, are also described. (The Polymer Corp.)

For free copy circle No. 3 on postcard

Carbon-Graphite

Carbon-graphite materials, for mechanical use, are the subject of an illustrated engineering guide. It recommends grades for seals and sliding surfaces to suit many liquids and gases at operating temperatures up to the cyrogenic range. In addition, the bulletin tabulates 18 grades of carbon, graphite and carbon-graphite for mechanical uses such as bearings, bushings and seals. (National Carbon Co., div. of Union Carbide Corp.)

For free copy circle No. 4 on postcard

Air Gaging

Thirty-two illustrated pages serve as a tool to aid proper gage selection in an engineering and purchasing guide. It's also a source of basic-design data. For a copy, please write on your company letterhead to Standard Gage Co., Poughkeepsie, New York.

For free copy circle No. 5 on postcard

Casters and Wheels

Thirty-five catalog pages present illustrated data on industrial, pneumatic and precision casters; industrial and pneumatic wheels. Sections on special caster accessories and military-specification casters and wheels are included. (Saginaw Products Corp.)

For free copy circle No. 6 on postcard

Control Station

This new publication gives the dope on an electric, manual-automatic control station. The information covers features, functions, available accessories and technical specifications. It also gives a technical description of the control station. (Republic Flow Meters Co.)

For free copy circle No. 7 on postcard

Cleaning Chemicals

Practically a handbook, a new 14-page booklet simplifies the selection of cleaning chemicals. It gives extensive information on the most commonly used compounds. It also suggests applications, working temperatures and procedures. By fol-

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 5/4/61

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Company .....

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FREE LITERATURE

lowing these recommendations, users of ultrasonic cleaning equipment can select the chemical best suited for a specific cleaning problem. (Branson Instruments, Inc.)

For free copy circle No. 8 on postcard

Automation Systems

This new bulletin explains how drive speeds of machines and processes can be automatically controlled and regulated by simple pneumatic instruments. Concise drawings and text material show how the instruments control liquid level, line pressure, process temperature, constant flow and motor loading. (Reliance Electric & Engineering Co.)

For free copy circle No. 9 on postcard

Air Cylinders

In full color, a 20-page bulletin explores the features found in a line of cushion-type air cylinders. These units boast an easily-serviced rod cartridge, removable with only a wrench. They meet all JIC standards. Schematic drawings complement the bulletin's text and aid in part identification. (The Sheffer Corp.)

For free copy circle No. 10 on postcard

Resistor Wire

By means of pictures, charts and diagrams, a new bulletin describes the properties of an improved iron-chromium-aluminum alloy wire for low-cost resistors. Data on temperature resistances, elongation versus wire diameter, breaking strength versus wire diameter and other pertinent characteristics is included. (Molecu-Wire Corp.)

For free copy circle No. 11 on postcard

Snap-Action Switches

Precision, snap-action limit switches are the subject of a brief bulletin. Photos show the three available forms — button-operated, plunger-operated and roller-lever-operated models. Typical uses are illustrated. The sheet also contains dimensions, ratings and pricing information. (General Electric Co.)

For free copy circle No. 12 on postcard

Cut-Off Machine

An 8-page bulletin illustrates a recently-introduced, cut-off machine and gives the details on performance. Basically, the new machine is a 12-in. unit that comes in four models. Each of the four is tailored for one of the following operations: Dry-abrasive cutting, wet-abrasive cutting, non-ferrous cutting or wood cutting. The bulletin also includes specifications and listings of all motor controls. (Rockwell Mfg. Co.)

For free copy circle No. 13 on postcard

Pneumatic Equipment

In 64-pages, a new catalog covers a complete line of pneumatic products. Included are data on compressed-air filters, pressure regulators, air-line lubricators, valves and other miscellaneous products. In addition, there's a section devoted to useful engineering data, such as a compressed-air flow chart, moisture content of saturated compressed air and dimensional data. (C. A. Norgen Co.)

For free copy circle No. 14 on postcard

Safety With Chemicals

Revised editions of four chemical-safety data sheets are now available from the Manufacturing Chemists' Assoc., Inc. These booklets are on benzene, nitric acid, paraformaldehyde and anhydrous ammonia. They list the characteristics of these chemicals, and also the hazards, with safety procedures and fire-fighting techniques to protect against them.

For free copy circle No. 15 on postcard

Rust Preventive

A 2-page specification sheet spells out the advantages and characteristics of an emulsifiable rust preventive. Once the water evaporates, the chemical remains. Thus, it provides dependable rust protection. Complete instructions on how to use the compound are also included in the sheet. (Magnus Chemical Co., Inc.)

For free copy circle No. 16 on postcard

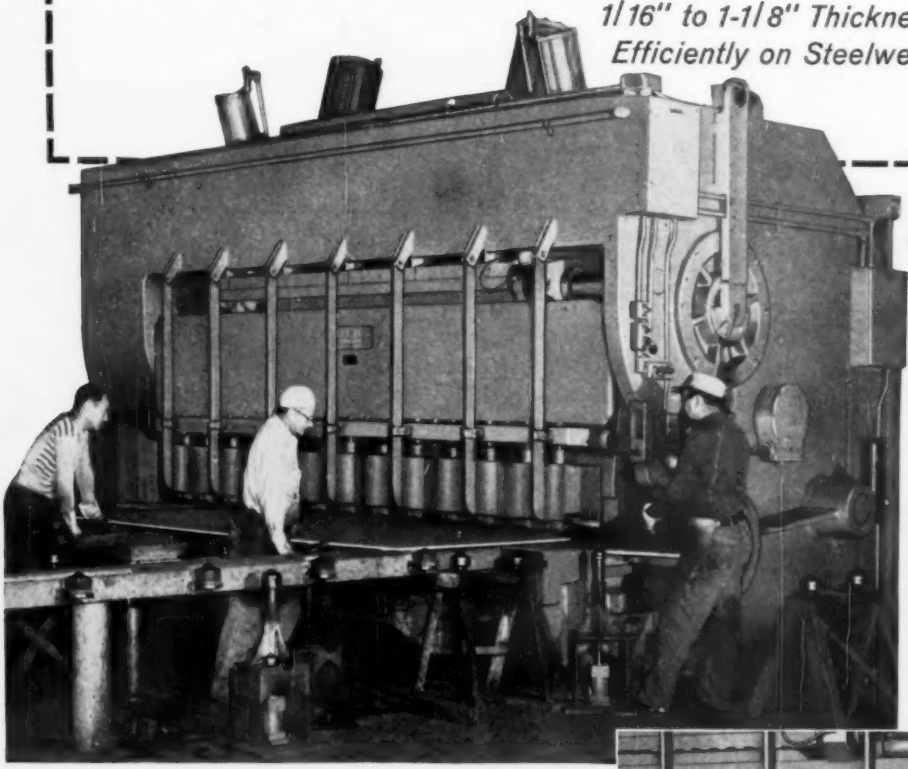
Recorder Inking

Two new ink-feed systems are the subject of 4-page bulletin. Each feed employs a common and universal-type nib. The literature describes a bladder feed system that boats flood-free operation with fast drying inks. It also details a capillary system. Page four lists the catalog numbers, and prices of the various components in each system. (Write Right Co.)

For free copy circle No. 17 on postcard

1000 Tons High Alloy Steels
PRECISION-SHEARED Monthly

1/16" to 1-1/8" Thicknesses Cut Efficiently on Steelweld Shear



Steelweld mechanical shear No. 24GA-12 cutting a 9/16" x 124" plate of 304 chrome nickel.

Some interesting details of this machine:

Capacity 1½" x 12'-0" mild steel — 8" stroke — 21 strokes per minute — 48" motorized back gauge — 20'-0" squaring gauge arm — 7'-0" front gauge outriggers — slitting guide — centralized lubrication system — air-operated ball transfers.

Adjusting gap between knives to provide correct clearance for plate thickness being cut. This adjustment is made in seconds, not hours, as required for some shears. Indicator has scales reading in plate thicknesses and in thousandths of an inch knife clearance. Note convenient up-front location of this important feature.

Addition of a Steelweld Shear boosted shearing capacity tremendously for Jessop Steel Company, Washington, Pa. More than 1000 tons of fine quality stainless, tool, high-speed and related alloy steels for which this 60-year old producer is noted, are sheared monthly on this machine — and every cut is sharp, straight, accurate.

The shear works continually 16 hours a day, 5 days a week, cutting thicknesses from 1/16 to 1⅛ inch. Frequently plate up to 240 inches long are slit by use of the Steelweld slitting arrangement.

The three Steelweld features most impressive to Jessop officials are:

1. The fast easy knife adjustment which can be quickly set to provide the best cut for every plate thickness.
2. The immediate, positive operation and long trouble-free life of Steelweld's air-cooled clutch and brake.
3. The massiveness and rigidity built into the frame and all working parts.

Jessop Steel has found that knives last three times as long on its Steelweld because of the knife adjustment feature. This means an important saving in knife costs, as well as a big reduction in down-time normally required for rotating or changing knives.

"A very fine operating shear" . . . "A machine that is doing a good job for us" . . . These are some of the comments of Jessop Steel production executives.

Steelweld Shears are available in all sizes for cutting steel plate to thicknesses of 2" and in lengths to 30'-0".

Write for free copy of catalog No. 2011

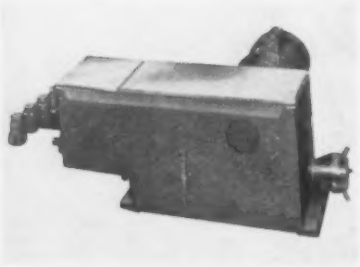
STEELWELD

PIVOTED BLADE *Mechanical and Hydraulic* **SHEARS**

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

STEELWELD MACHINERY DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4864 E. 282 ST. • WICKLIFFE, OHIO

New Materials and Components



Low-Flow Metering Pump Features Enclosed Drive

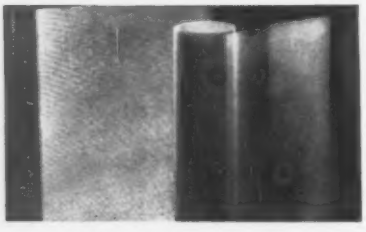
Since all its working parts are fully enclosed, a low-flow, controlled-volume metering pump suits chemical feed systems. It accurately meters many types of liquids, such as corrosive acids, toxic chemicals and water-treating chemicals. The pump is easy on the operator, too. He can adjust capacity while it's running. This is done either manually, or automatically from a control signal. It also means more flexible pumping operations. In addition, metering accuracy is 1.0 pct or better. (Milton Roy Co.)

For more data circle No. 26 on postcard, p. 99

Adapts Boring Machine for Contour Turning Jobs

This compact tracing attachment converts a vertical turning and boring machine into a contour turning lathe. It mounts to the ram or turret of the machine. Or, depending on the individual machine, it may take the place of the side head. No conversion is necessary. When tracing isn't needed, just remove the attachment. You're back where you started; set for conventional turning and boring. But, with the new unit on the job, you're ready to tackle OD, ID and facing operations. To hold the cutting tool, one tool holder comes with the tracing unit. But, other sizes are available as optional equipment. Universal mountings position the tool to the right or to the left. The tracer itself is complete with slide assembly, tracer, template rail and hydraulic power unit, with all lines and fittings. Specifications include: 4-in. cylinder bore, 9-in. stroke and 9- to 12-oz stylus pressure. (True-Trace Corp.)

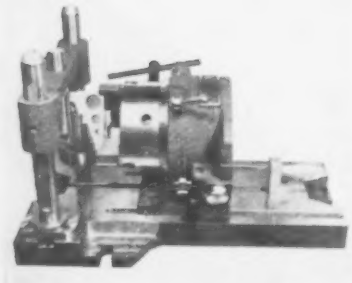
For more data circle No. 27 on postcard, p. 99



Glass Laminate Resists Moisture and Chemicals

Available in continuous sheets, strips and coils, a new epoxy laminate features a glass cloth (Mylar) facing. It boasts high strength/weight ratio. It's also moisture and chemical resistant. In addition, Mylar assures pore-free, high-dielectric surfaces. It's bonded to both faces and bond strength exceeds 750 psi. Thickness range: 0.015-0.062 in. (Swedlow, Inc.)

For more data circle No. 28 on postcard, p. 99



Drilling Unit Eliminates Need for Costly Jigs

For precision rotary positioning, a horizontal-drilling and spacer attachment provides fixture accuracy. But, there's no fixture cost or lead time. The newcomer teams a rugged, multi-index spacer with an accurate drilling device. It guarantees repeat indexing within low tenths; a radial accuracy of 0.001-in. cumulative error, on a 6-in. circle. A planer gage, a micrometer or gage blocks set up the attachment. Once set, it retains high accuracy, even under the torque of heavy drilling or boring cuts, interrupted cutting and side thrusts. (Erickson Tool Co.)

For more data circle No. 29 on postcard, p. 99

How to use Clad-Rex vinyl-clad metal in the design and engineering of hospital furniture and other products

Vinyl-Clad metal used in patient room furniture by American Seating

The sheet metal nature of Clad-Rex vinyl-clad metal would seem to indicate generally how it can be used. However, the unusual characteristics added by the vinyl coating itself make the areas of usage much broader than might be expected. So as not to overlook possible applications within your product line, consider Clad-Rex as a basic material. Measure each of its advantages against the individual parts and subassemblies of your products as well as the whole enclosure. In this manner your manufacturing methods and costs, your sales appeal, and product profit can be best helped.

The sales appeal of Clad-Rex vinyl-clad metal

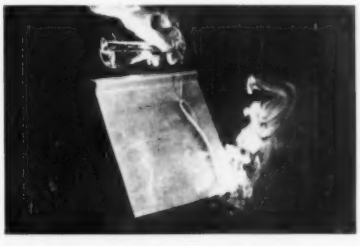
The vinyl surface of Clad-Rex is, in fact, a finish. It is available in a broad range of colors and embossed textures. Actually, Clad-Rex provides an almost unlimited variety of stock and custom multi-color patterns. Special prints in register can be provided also. The stock line, bleached walnut decor used by American Seating gives the feel and rich warmth of fine wood.

The abrasion resistance of Clad-Rex vinyl-clad metal

The vinyl surface of Clad-Rex, being a poly-vinyl chloride film, offers great resistance to abrasion. This wearability would include scuffing and scraping. Texturing effectively hides even deep cuts in the vinyl surface. This resistance to abrasion enables American Seating to capitalize on fine finish without extraordinary care in handling during manufacturing. Matter of fact, rejects common to highly finished products are greatly reduced with vinyl-clad metals.

The corrosion resistance of Clad-Rex vinyl-clad metal

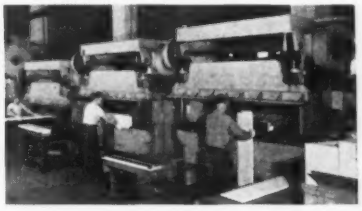
Having all the advantages of poly-vinyl chloride, the surface of Clad-Rex vinyl-clad metal protects against acids, alkalis and other corrosive chemicals. It is free of pin holes. As a result, it offers unusual dielectric properties as well.



The tops of the "Bedside Susan" Cabinet and "Overbed" Butler in the American Seating group are sanitary white, non-staining Clad-Rex.

The fabrication of Clad-Rex vinyl-clad metal

American Seating methods for fabricating Clad-Rex vinyl-clad metal are much like they used for bare sheet metal. Finishing, of course, is not needed. Press and brake forming, crimping, etc., are all practical.



Most important to any remarks about fabrication—although Clad-Rex is obviously different from bare metal, the unusual quality of the vinyl-to-metal bond tends to minimize the difference. As a result, American Seating fabricates within their own facilities without complex or unusual techniques or tooling.

All conventional, mechanical methods of fastening are commonly used. However, although vinyl-clad metal parts can be assembled with stud and projection resistance welding, some limitations in spot and seam welding do exist. Until the present research for a solution is completed, other conventional methods of joining must be used.

A source of engineering service

Take full advantage of the engineering and research facilities of Clad-Rex. Call or write for Report 6101, "How to Use Vinyl-Clad Metal in the Design and Engineering of Commercial Furniture". *Simoniz Industrial Products, 11506 West King Street, Franklin Park, Illinois (Phone Gladstone 1-2323).*

Clad-Rex Vinyl-Clad Metal is a product of

RESEARCH • DEVELOPMENT • ENGINEERING

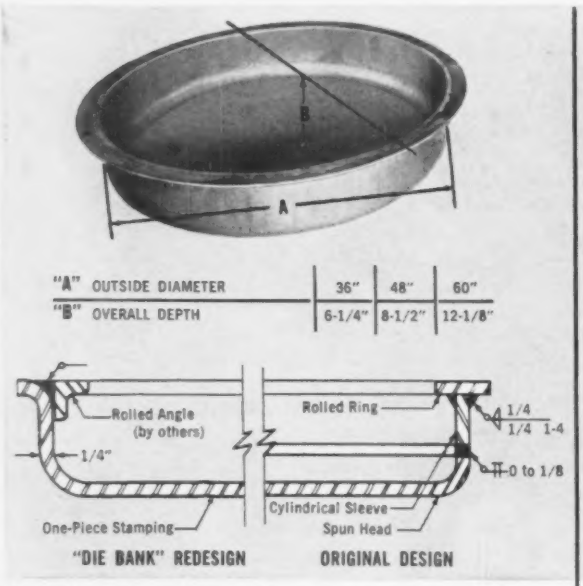
SIMONIZ INDUSTRIAL PRODUCTS

A Division of Simoniz Company

CLAD-REX VINYL-CLAD METALS • **SIMONAIRE** FOAMS AND INDUSTRIAL CHEMICALS
SIMONIZ RESEARCH, DEVELOPMENT AND ENGINEERING

Superior Parts at Lowered Cost with This Fresh Approach to Stamping

Many parts in use today are better as a result of design refinements suggested by COMMERCIAL's stamping experts. The examples below demonstrate how these design refinements have resulted in superior parts for the OEM at lowered cost. These examples may appear to you as unusual in design and this is the point...

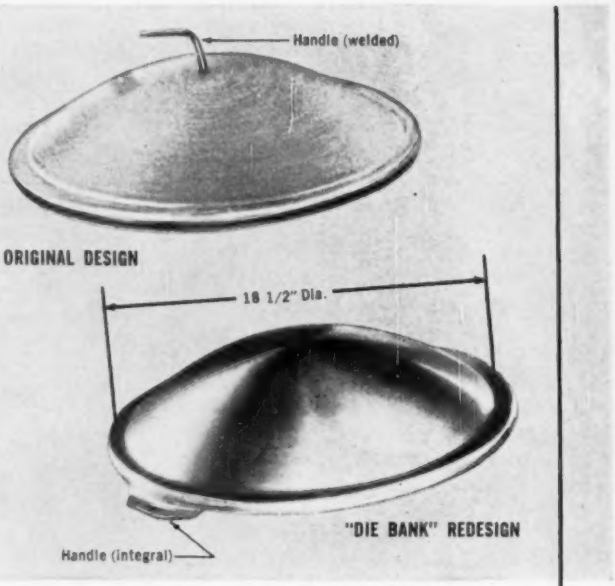


One Piece Stamping . . . Improves Appearance, Replaces Three Piece Weldment

Circular steel boiler doors 36", 48", 60" diameter were formerly fabricated from three basic components—spun head, cylindrical sleeve and ring rolled the hard way.

Problem: eliminate accumulative assembly variables caused by inherent non-uniformity of three components—upgrade product appearance.

Solution: one piece smooth surface COMMERCIAL steel stamping shaped in a die assembled from stock "die bank" components (for details of "die bank", see box upper right). Stamping tolerances plus or minus 1/16" (flat across flange within 1/16"). Result—accurate finished product because former difficult assembly and time-consuming fitting-up problems eliminated. All outside exposed welds (about 16 ft. on the 48 in. side) and grinding discontinued. An end product with improved appearance—better product appeal.



Stampings . . . Unitize Construction, Replace Inaccurate Stainless Steel Spinnings

Original contruction of bulk milk cooler used tank manhole cover spinning—requiring welding, grinding and polishing.

Problem: reduce production finishing time, overcome welding heat distortion of stressed metal-spinnings, increase strength, produce uniform parts and improve sanitation properties.

Solution: COMMERCIAL's "die bank" proved a nucleus for a one-piece stamping redesign including integral handles. Basic stamping details—size, shape and gauge were tailored to stock die components. Realization—smoother finish of stamping creates a more sanitary, better appearing tank. Closer tolerances of stamped cover provide flange with definite "drop-on" vacuum seal. Fewer parts resulting from stamping. Unitization greatly diminishes production time and component cost.

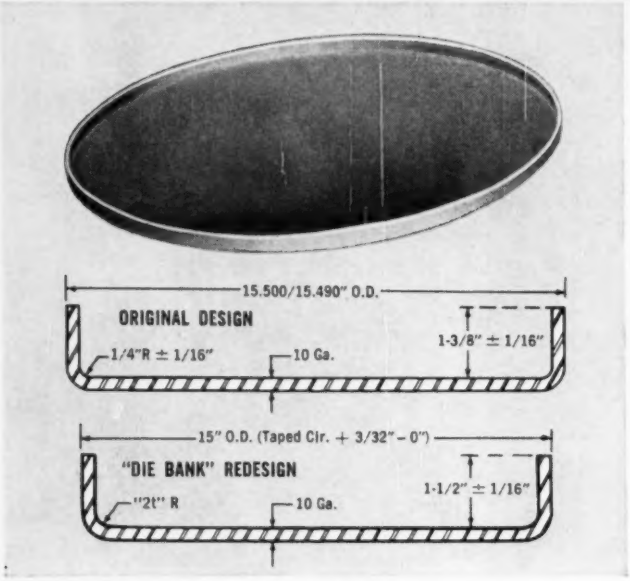
"Die Bank" Facts

Over 50,000 stock die components stand ready to go to work for you at COMMERCIAL. These components can be combined in endless variety—can prove, as they have for others, invaluable in your stamping design.

Components for circular stampings cover a diameter range from 2½" to 72". To 30" O.D., increments are in units of 1". Over 30" O.D., increments progress from 1" up to 6" for the largest diameter. Under 24" O.D., many sizes are available in fractional inches.

Stampings from these die components range from 20 gauge to ¾" thick. Contour can be flat or dished to any one of many patterns. Stampings can be supplied with vertical, horizontal or reverse flanges—or without any flange.

Use of COMMERCIAL's "die bank" results in many stampings made to basic original design free of heavy tooling cost—minor design latitude often eliminates all die expense. Catalog 200-C1 "Standard Metal Shapes" should be in your hands when preliminary designs go on the board.



"Die Bank" Stamping Gets O. K. . . .
Reduces Cost of Tailored Design

Original design of agriculture combine cylinder head called for odd fractional dimensions. Tolerances were tighter than necessary and applied in conflict with best stamping practice. Details were established without knowledge of COMMERCIAL's "die bank". Result—high unit cost to produce basic part to individually tailored size. Special dies, not in existence, were required.

Problem: redesign a more practical part to be mass produced at low unit-cost—eliminate special die cost.

Solution: simple redesign using stock die components from COMMERCIAL's "die bank" cancelled out $1850 partial die cost required for tooling original design. Net die cost: zero. Piece price reduced: 16 cents. Savings on initial requirement: over $2200. A stamping made to commonly accepted tolerances at lower cost without sacrificing product quality was the answer.

Advantages of Stampings

Economy of production
—metal conservation, waste material minimized, stamped parts have greater surface area than blank the part is made from—without loss in strength
—high quantity man-hour output from fast production machines—low unit cost

Greater strength: predicted, controlled, unvarying
—higher proportionately, in relation to weight, than possible in other metalworking processes

Enhanced appearance: finish is predictable, uniform, "as specified"
—multiple selection of basic material and its finish facilitates maintaining appearance in stamping the part or its further processing

Features of COMMERCIAL Stampings

Specialized equipment
—modern presses with capacity over 2000 tons; facilities located in three strategic metal producing centers

Economical large or small runs
—medium to heavy, shallow or deep drawn stampings

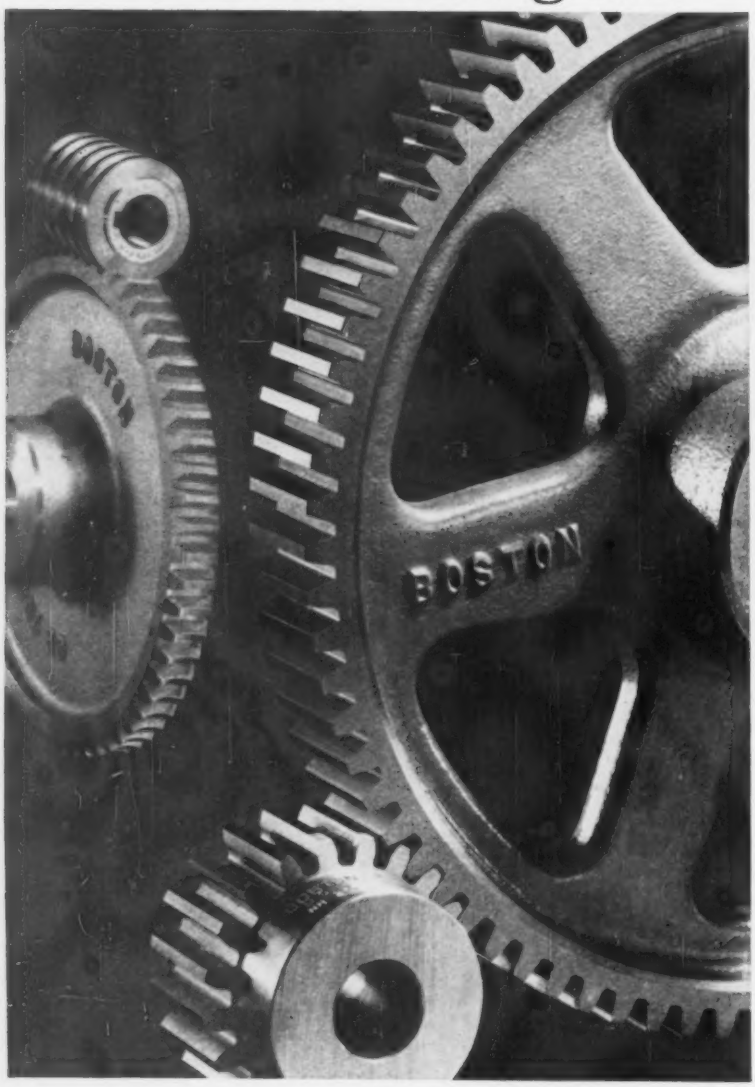
Facilities for finishing
—drilling, boring, tapping, machine trimming, burning, welding, painting, etc.

While designs are on the board, or redesign of parts in usage are fresh in mind, why not call on COMMERCIAL'S technical service—send print, sketch, sample or prototype. Address: Commercial Shearing & Stamping Company, Dept. K-18 Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping

BOSTON Gear® QUALITY

largest selection
14½° P.A. stock gears



From local stock – at factory prices
Spur, helical, worms and worm gears.
1781 types and sizes, from 48 to 3 pitch.
Brass, steel, iron, and non-metallic.
See Catalog 57 for complete listings.
IN STOCK at your nearby **DISTRIBUTOR**

BOSTON Gear®

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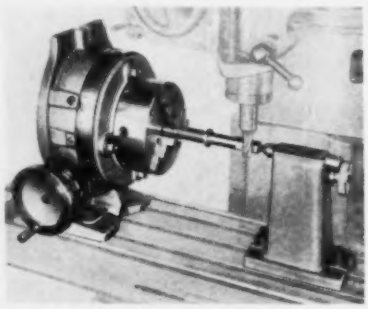
Quincy 71, Mass.

DESIGN DIGEST

Two-Way Rotary Table

The latest addition to a line of precision machine-tool accessories is a 9-in., 2-way rotary table. The table mounts either vertically or horizontally. Its right-angle base is a high-strength, semi-steel casting. Both faces are ground to ensure trueness when used in either position. For the operator's convenience, table circumference and handwheel dial are graduated to allow settings in degrees and minutes. These graduations are easy to read and accurately cut. (Nichols-Morris Corp.)



For more data circle No. 30 on postcard, p. 99

Controls Porosity

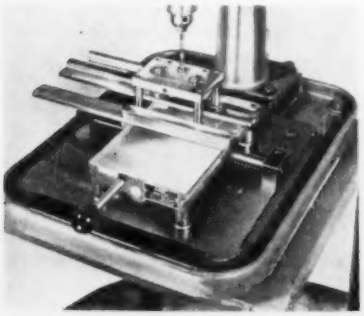
Controlled porosity in high-temperature parts has widespread use. By means of a new process, engineers can design porous-metal properties into complex shapes. Besides porosity control, the process also gives control of ductility and liquid and air permeability. Related physical or mechanical property regulation is also possible. Materials can be multi-layered, alloyed or impregnated. Finished products can be welded, brazed, soldered, formed or machined. A stainless steel wind tunnel model typifies a product fabricated by the process. It permits flow through the nose faster than through the base. (Mott Metallurgical Corp.)

For more data circle No. 31 on postcard, p. 99

Tool Slide Lock

Newly developed, a machine-tool device increases production, improves work quality, reduces set-

up time and eliminates accidents on drilling and tapping machines. It's the ideal solution for holding work



on drill presses and tapping machines without time-consuming clamping. The operator slides the tool to the desired location, then drills at maximum speed with complete safety from whirling tools and chips. The device eliminates the need for slots and tapped holes in the table. It locks in a crosswise or lengthwise position, or both. (Lassy Tool Co.)

For more data circle No. 32 on postcard, p. 99

Environmental Switch

Designed to operate in temperatures from −65° to 600°F, a new hermetically-sealed switch features a rotary-linkage actuator. Its temperature range suits the unit for operation near jet afterburners, missile exhausts and other high temperature air and missile uses. The switch provides positive actuation and release, regardless of adverse ice and dirt conditions. By turning

a worm gear in the lever arm, the linkage lever can be adjusted through 360 degrees. (Minneapolis-Honeywell Regulator Co.)

For more data circle No. 33 on postcard, p. 99

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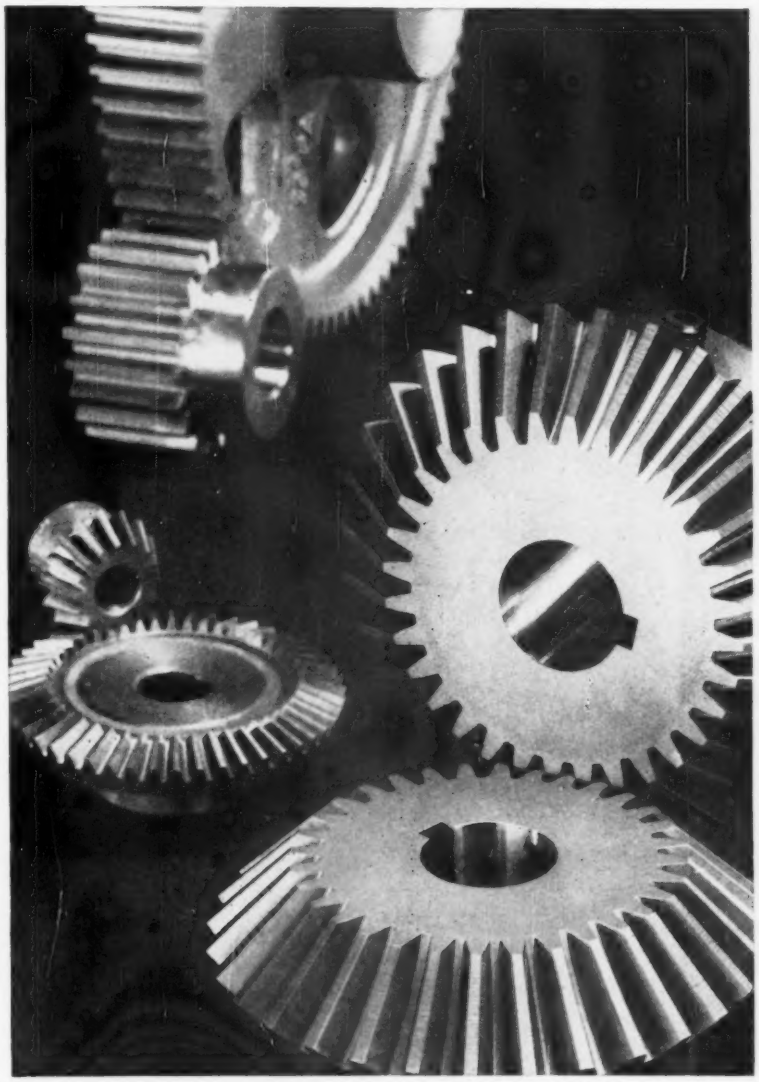

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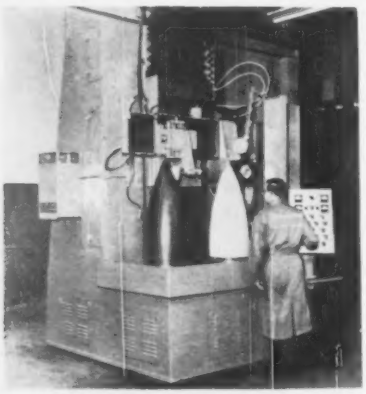
New Equipment and Machinery

Shear Welder Eliminates Coil-Change Shut Downs

This tungsten, gas-shielded arc machine welds non-ferrous metal, steel and stainless steel. It allows any strip-forming machine to run continuously. There's no shut down for coil changes. The welder shears off the tail end of the outgoing coil and the leading edge of the incoming coil. Then it butts the two ends together and makes the weld. When the weld's done, it opens up. The strip continues on through. (Behrend Machinery, Inc.)

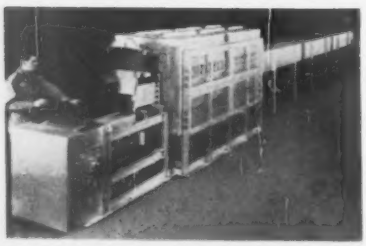
For more data circle No. 50 on postcard, p. 99



Contour-Grinding Machine Features Dual Tables

A new, dual-table, contour grinder uses a 3-dimensional master. In operation, an electro-hydraulic tracer system follows the master on one table to produce a duplicate, within 0.0005 in., on the other. The grinder embodies some built-in advantages. In the first place, vertical design eliminates the deflection of the workpiece inherent in horizontal machines. Secondly, the upright configuration reduces floor-to-floor time, since parts load easier and center faster. The tracer system is also of interest. It has a transistorized electronic control for compactness. The hydraulic part of the system guides both the vertical and horizontal travel simultaneously through 180° of motion. During this travel, stock removal is constant on all surfaces. (The Kaydon Engineering Corp.)

For more data circle No. 51 on postcard, p. 99



Mesh-Belt Furnaces Maintain Atmosphere Purity

Designed to give pure atmosphere, a modern line of mesh-belt furnaces suits continuous brazing, annealing and sintering jobs in many industries. They're economical, too. Here's why. Gas-flame curtains and adjustable end doors assure low, atmosphere-gas consumption. These features also ban infiltrating air—a must for pure atmosphere. Furthermore, constant time/temperature cycles yield uniform treatment. (Harper Electric Furnace Corp.)

For more data circle No. 52 on postcard, p. 99

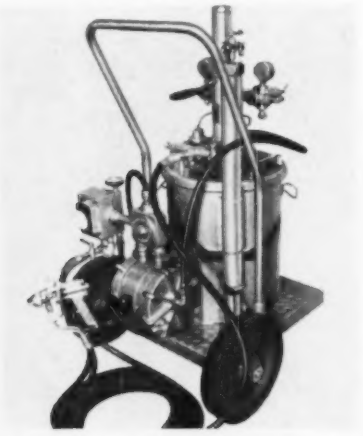
Internal Grinder Boasts Unusual Reliability

For miniature work, a new addition to the internal grinding field has a minimum of moving parts. This means there is less to go wrong. Also, careful engineering design upgrades accuracy and speeds the work. For instance, incremental wheel compensation is infinite throughout a range from 0-0.001. This sensitivity improves wheel life. In addition, a direct-reading digital dial shows the amount of wheel life remaining. Thus, the operator can anticipate the time of the wheel change. This means he's free to attend other machines. There's built-in accuracy, too. The vibration-damped, feeding cross slide moves on anti-friction ways and provides constant repeatability. (The Heald Machine Co.)

For more data circle No. 53 on postcard, p. 99

Sprays Hot Fluid

Satisfying a 2-coat requirement with a single spraying pass, a self-contained, hot-spray unit raises application speed by 50 pct. It also boasts better quality control on film deposit, critical edges and elimination of sags and runs. The system features a double-action pump that suits any material from clear to highly abrasive. Its recirculating assembly allows constant recirculation of the heated material, without returning it to the main supply. (The Spee-Flo Co.)



For more data circle No. 54 on postcard, p. 99

Detects Part Flaws

The vibrating crystal is intimately coupled to the object being tested, in this new ultrasonic flaw detector. This eliminates the need for the normal liquid coupling. Instead, a synthetic membrane fits tightly over the transducer. Mechanical vibrations are sent in a pulsed beam. Flaws in the part, as well as the opposite side of the part, reflect these vibrations back to the transducer. The unit amplifies these echoes and displays them as time/amplitude signals on a viewing screen. (Ultrasonic Div., Circo Corp.)

For more data circle No. 55 on postcard, p. 99

New Honing Machine

A versatile, heavy-duty machine has a wide range of easy-to-select spindle speeds. It also boasts double-reduction belt drive that delivers full power from a ½-hp motor to the spindle at all operating speeds. This drive is fully enclosed to promote safety, improve appearance and insure long, trouble-free service. An additional control permits sensitive adjustment of light, stone-cutting pressure. The new machine handles any honing on 0.100- to 2.625-in. bores with standard tooling available from stock. Bores to 5.500 in. can also be honed with tooling built to order. (Sunnen Products Co.)

For more data circle No. 56 on postcard, p. 99

Die-Thread Machines

Basic design changes in two die-thread rolling machines give added versatility and reduce setup time. Die holders now include removable, front-bearing supports. This allows changing or replacing dies, without removing the die holders. (Reed Rolled Thread Die Co.)

For more data circle No. 57 on postcard, p. 99

Humidity Chamber

Facility in meeting the requirements of MIL-202B is one advantage of this controlled relative-

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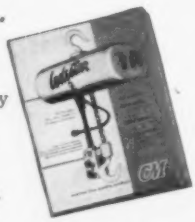

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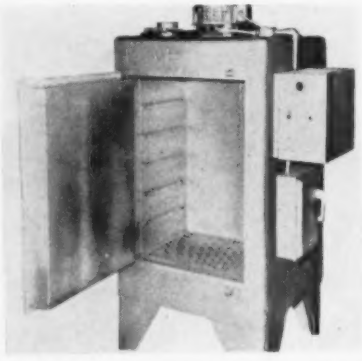
wet and dry bulb. The control system does not use contacts or arcing devices. Straight-line performance is guaranteed for both wet- and dry-bulb controls. Other features include: Adjustable airflow, copper cooling coil, recorder, 24-hr program timer and a hygrometer. (Blue M Electric Co.)

For more data circle No. 58 on postcard, p. 99

All-Purpose Ovens

Two improved models in a line of ovens provide closely-controlled heat for processes with operating ranges to 1200°F. One of the models has a temperature range to 650°F. It suits such uses as epoxy-resin encapsulation and motor bake-out. The other ranges to 1200°F for glass annealing and aluminum-



braze preheating. Both ovens come as packaged units, with all controls wired in. They're ready to plug into a power supply. (Trent, Inc.)

For more data circle No. 59 on postcard, p. 99

Bending Press

Unusually compact, this bending press requires only 10 ft of floor space; yet it produces up to 1500 bends per hr. The high-speed machine achieves good-quality bends in work up to 1-in. OD x 16-gage, wall-steel tubing or the equivalent. It's completely self-contained and hydraulically-operated. A 15-hp motor supplies the power. Progressive bending of up to 10 different angles is achieved automatically with the 10-position indexing turret. No cycle time is lost cycling through idle stations, since the turret auto-

matically returns to its starting position after the last bend. (Pines Engineering Co., Inc.)

For more data circle No. 60 on postcard, p. 99

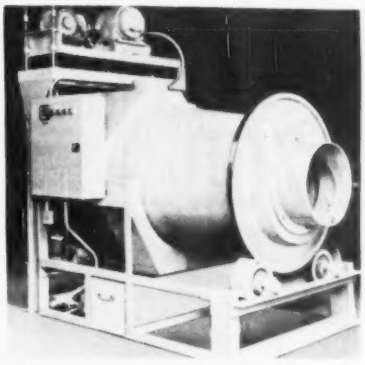
Melting, Dipping Tank

Particularly appropriate for use with rust-preventive oils and preserving compounds, a strip-heated tank comes in seven models. It is an efficient melting and dipping facility that's safe and convenient. The tanks have from 5-295 gal capacity. Larger ones are available on a custom-built basis. All tanks feature heavy-duty construction and built-in safety. (Aeroil Products Co., Inc.)

For more data circle No. 61 on postcard, p. 99

Sawdust Barrel

Automatic control of tumbling cycles, of separation and media retention and of finished-parts discharge are all features of a new 36-in. sawdust barrel. The unit minimizes hand labor in batch drying and polished-metal parts. Gas heats the drum. A metal hood retains heat in the tumbling compartment. A magnetic turnover device is avail-

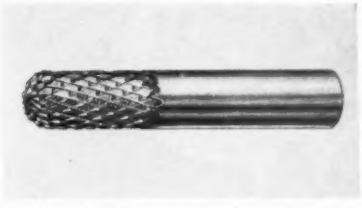


able to dump entrapped media from cup-shaped parts for thorough rinsing. (Minnesota Mining & Mfg. Co.)

For more data circle No. 62 on postcard, p. 99

Solid Carbide Mill

Here's a new-type, solid-carbide end mill for refractory metals Rockwell 50C or harder. Because of its tendency to counterbalance the right-hand turning action of the spindle, the mill is a neutrally-stressed tool, free of any tendency to pull forward, grab, or chatter. It opens an entirely new approach to the interrupted or uninterrupted machining of hard metals. Great web strength, rigidity, and efficient chip disposal results in remarkable econ-



omy and efficiency. The mill comes in sizes up to 1-in. diam in solid carbide. All sizes are also available in ball-end style. (The Metal Removal Co.)

For more data circle No. 63 on postcard, p. 99

Deburrs Gears

There's no top housing or superstructure to interfere with heavy work handling on this new gear-deburring machine. Through the use of double arms, both sides of gear teeth are deburred at the same time. The capacity of the machine is from

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Most important among these profit producing features are: positive control force feed; clockwise blade rotation to reduce teeth shock — increase blade life; convenient 36" machine height to reduce operator fatigue; large 14" x 24" capacity; push button control; dual movable vise jaws; adjustable blade tension.

For complete details on this amazing new machine tool, phone, write or wire your Kalamazoo representative. Facilities for test runs of your material on the "Big K" are at your disposal — at no obligation.

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NEW EQUIPMENT

8-60 in. in diam and up to 28-in. face. A ½-hp, variable-speed drive rotates the work. It handles almost

all types of gears and sprockets made of steel, cast iron or bronze. (Davis & Thompson Co.)

For more data circle No. 64 on postcard, p. 99

Folding Magnifier

This folding micrometer magnifier comes complete with measuring graticule included. It fills the gap between rough estimation with a scale, and elaborate measuring tech-

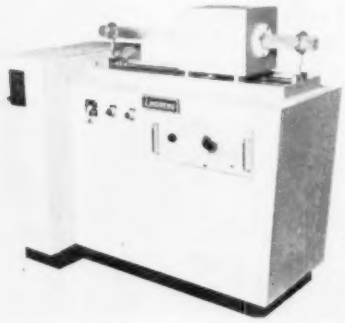
niques. The view field is 1-in. square. The scales are etched on opaque white. Reading accuracy is to 0.002 in. (The Ealing Corp.)

For more data circle No. 65 on postcard, p. 99

Zone Refiner

For zone levelling 18-in. germanium bars and zone refining potassium chloride or bromide, a horizontal furnace comes as a completely packaged unit. The furnace design also lends itself to epitaxial growth along with the straight-diffusion processes. Power to the

nichrome heating elements comes from a tapped-element transformer and a saturable-core reactor. A small mass of potassium-titanate in-

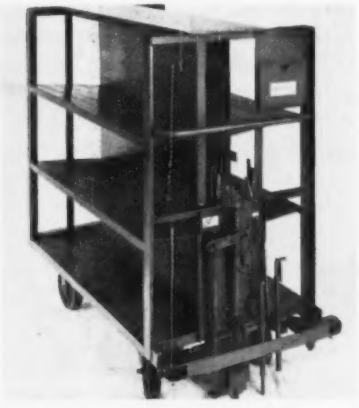


sulation results in minimum shell temperatures and rapid heating and cooling of the furnace. (Lindberg Engineering Co.)

For more data circle No. 66 on postcard, p. 99

Switch Cart

For automatic switching from a dragline conveyor, load trucks feature a special switching mechanism. A shock-absorbing pushing bumper and tow pin are provided so that other trucks on the conveyor will easily push a switched-off truck onto the non-powered spur. The mechanism is all mechanical; simple, rugged and inexpensive. Up to 100-

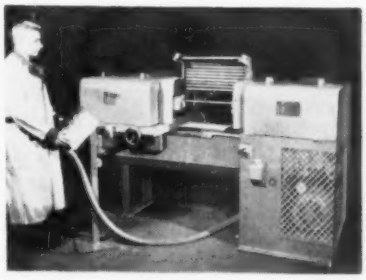


station selectivity is possible on a 32-in. wide track. (S. I. Handling Systems, Inc.)

For more data circle No. 67 on postcard, p. 99

Double-End Finisher

Filling the need for a high-production, flexible unit, this new machine handles double-end finishing operations on tube, rod and pipe in diameters from ½-3 in. The standard-bed finisher accommodates 2½-60-in. lengths. An extended-bed machine handles up to 120 in. End-to-end tolerances are consistently held within .005 in., on a production basis. Typical production rates range from 2400-3000 ends (1200 to 1500 finished parts) per hour. To achieve this rate, workpieces are automatically fed into machining

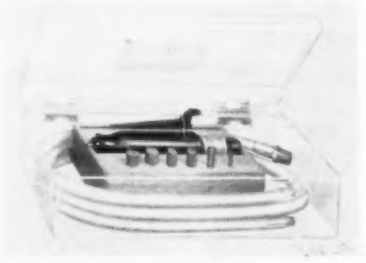


position by the hydraulically-operated feed mechanism. (Pines Engineering Co., Inc.)

For more data circle No. 68 on postcard, p. 99

Midget Grinder

Ideal for precision tool and die grinding, a small pneumatic grinder



has constant-speed air motors that operate at 38,000 or 60,000 rpm. Constant speed assures good control under all phases of use. Included in each kit is a grinder, four mounted points, one carbide mill, wrenches, whip hose and plastic case. (The Airetool Mfg. Co.)

For more data circle No. 69 on postcard, p. 99

Functional Test Stands

Representing a new approach to the functional testing of tractor-lift assemblies, this test stand electronically detects internal-component oil leakage of ½ cu cm at 3000 psi during a 2-minute test period. Along with the leak test, the test stand duplicates actual field condi-

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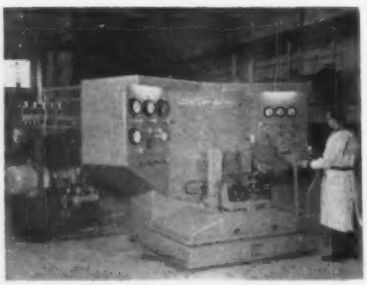
tions, one of which is an 8000-lb lifting operation. Throughout the test, the operator has a visual and



electronic readout of the test. (Century Hydraulics, div. of Century-Detroit)

For more data circle No. 70 on postcard, p. 99

Heat-Treat Furnace

Positive, protective atmosphere for high-carbon, high-chrome and high-speed steels is created within the work chamber of a new electric furnace. This effective atmosphere requires no adjustment or special operator skills. Tools can be "soaked" to assure full hardness, without the danger of surface de-

terioration. There is no chance for scale to form or for decarburization to take place. (The Sentry Co.)

For more data circle No. 71 on postcard, p. 99

Mobile Bath Shaker

Mobility has been added to an apparatus for metabolic incubation and other experimentation involving agitation at controlled temperatures. It suits fields such as microbiology, tissue culture, chemistry, bio-chemistry and physiology. A wide range of temperatures and agitation can be accurately controlled and reproduced at any time. The water bath heats rapidly to pre-set temperatures from ambient to 100°C, with uniformity of ±½°C. The unit maintains water levels automatically, with an overflow device. (New Brunswick Scientific Co., Inc.)

For more data circle No. 72 on postcard, p. 99

Ultrasonic Drill

Almost twice as efficient as the old model it supersedes, a new drill performs multiple machining, slic-

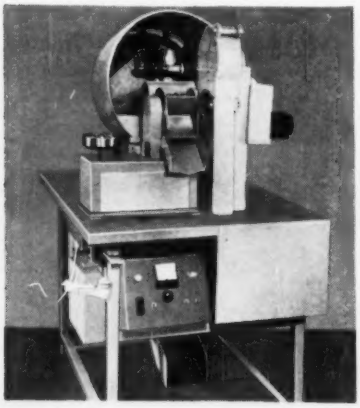
ing, cutting and etching operations. It handles tool sizes up to ¾ in. on a diagonal. Sample cutting rates using this tool include glass at 0.2 ipm, ceramic 0.06 ipm, ruby 0.01 ipm, ferrite 0.03 ipm, geranium 0.05 ipm and tool steel at .008 ipm. On the other hand, holes as small as 0.002-in. diam in ferrites, ceramics and tungsten carbide are handled with equal ease. (Gulton Industries, Inc.)

For more data circle No. 73 on postcard, p. 99

Counts Parts, Batches

Featuring fast changeover and high speed, an automatic parts counter bulk counts and also batches in small lots. It handles an unusual variety of part sizes and shapes, ranging from paper clips, ball bearing assemblies and fasteners of all types, to candy and drug capsules. And, it does it at speeds to 450,000 parts per hr. The items can weigh between 0.01 and 2.5 oz, and range in size to about two in. Perhaps the most outstanding

feature is flexibility. In about two minutes time, an attendant can stop one counting operation, empty the

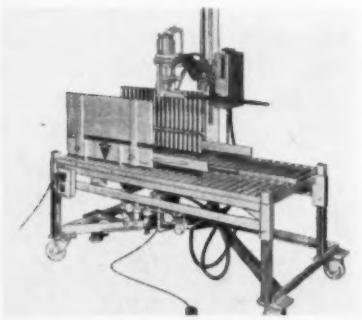


machine, reset the simple controls and begin counting another product. (Atronic Products, Inc.)

For more data circle No. 74 on postcard, p. 99

Dual Stapler

To close corrugated cartons, a dual machine staples top and bottom at the same time. Special high-center device arms with carton-guide extensions accommodate extra-long and extra-high cartons. The machine has a special leg adjustment to enable it to handle many different heights. Wheel casters and locks are standard equipment. Thus, the stapler moves about easily in

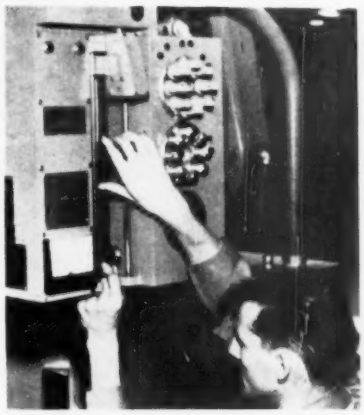


any packaging department, without interrupting production. (International Staple & Machine Co.)

For more data circle No. 75 on postcard, p. 99

Turret Drills

A line of tape-controlled turret drills features a depth-stop drum that mounts on the operator's control station. This design puts the depth-stop settings and the approach and return cams within easy handling distance. To the left of the control drum, is the feed-rate meter which indicates the spindle-feed rate. On the right, are the speed- and cycle-control knobs, the pre-selective, spindle-feed knobs and a standard-machine, pushbutton control station. Thus, all func-

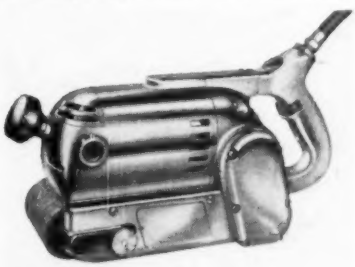


tions of the machine are represented on the central station. (Burgmaster Corp.)

For more data circle No. 76 on postcard, p. 99

Sands Most Materials

An air-powered belt sander suits continuous, heavy-duty finishing operations. It's now being marketed in a new model with several design improvements. From a mechanical standpoint, the major change is in the throttle. The new one permits the guiding hand to regulate speed. In addition, it provides an infinite number of speeds up to 1120 sfpm to completely control a sanding op-



eration from rough to fine. Another change from the earlier model is an aluminum handle that replaces the previous plastic one. It wears better. Also, the air hose inlet has been moved to the top of the new

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Like the motor in your car or truck, what's under the hood of your **Kinnear Rolling Door** is as important a part of its extra value as the part that is always in view.

Concealed in the hood of each **Kinnear Rolling Door** is a mechanism so skillfully engineered and ruggedly built that it has no equal for long-lasting, low-cost efficiency.

In fact, the rugged precision of Kinnear's under-the-hood mechanism is one of the reasons it so seldom needs to be seen (just as you seldom look under the hood of a car with a trouble-free motor).

Although this sometimes makes the first cost of **Kinnear Rolling Doors** a little bit higher than "copies," *it also assures lowest-cost door operation and maintenance.*

Under-the-hood quality is also one of the reasons so many **Kinnear Rolling Doors** have served continuously — *often in daily use* — for more than half a century!

In addition, **Kinnear Rolling Doors** offer coiling upward action that clears the entire opening quickly . . . saves floor, wall and ceiling space . . . keeps the opened door curtain out of the reach of damage by wind or vehicles.

When fully closed, **Kinnear Rolling Doors** *provide extra protection* against wind, weather, vandalism, trespass—even against fire. (Heavy galvanizing** resists corrosion, and Kinnear Paint-Bond makes any finish coating you apply adhere immediately and last longer.)

**Hot-dip galvanizing adds 1.25 ozs. pure zinc to each sq. ft. of metal (ASTM standards).

Kinnear Rolling Doors are built in any size. Write for information, or for recommendations on your door needs.

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Saving Ways in Doorways

NEW EQUIPMENT

handle for better visibility and easier handling. (Buckeye Tools Corp.)

For more data circle No. 77 on postcard, p. 99

Electric TIG Welder

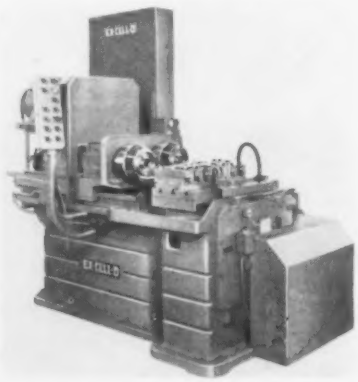
Designed for a welding range of 13-295 amp, a new ac welder boasts economical operation. Its many deluxe features include fully-rated duty cycles for Tungsten - Inert Gas-Shielded welding. They are 40 pct at 200 amp; 30 pct at 295 amp. Gas and water are electrically controlled. Operation is direct or re-

mote. High-frequency intensity control is another bonus. (The Emerson Electric Mfg. Co.)

For more data circle No. 78 on postcard, p. 99

Cam Boring Machine

Used to produce a cast-iron clutch component, this two-spindle cam-operated boring machine generates 21 surfaces at a single setup. It does



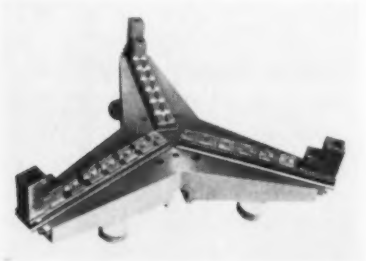
this with single-point tools guided by an accurate master. In operation, two parts are manually loaded. Then, all the individual cutting op-

erations are performed in one rapid, continuous motion. Production is 100 parts per hr. (Ex-Cell-O Corp.)

For more data circle No. 79 on postcard, p. 99

Welding Chuck

For precision welding, a new workholder features a self-centering chuck. This chuck has a capacity



from 3-40 in. Larger sizes are available on special order. The manufacturer describes this device as a fast, accurate precision-built workholder for precision welding. Hardened-steel jaws open and close at a turn of a handle. All work is centered automatically. (Skinner-Horton Chuck Div., Skinner Precision Industries, Inc.)

For more data circle No. 80 on postcard, p. 99

Surface Grinder

Making its American debut, a surface grinder possesses a host of

features. It has coordinated ram-stroke speed and table rotation, for constant grinding speeds at any position. There's centrifugal-pressure lubrication of the grinding wheel, to reduce heat and wheel pickup; plus, complete isolation of tank, motor and pump, to reduce vibration. It has pushbutton controls; and, through the addition of special accessories, completely-automatic operation. For American use, all scales and indicators read in inches. (Mitsui & Co.)

For more data circle No. 81 on postcard, p. 99

Finishes Extrusions

The condition of the rough extrusion, and the final finish desired, determines the number of finishing heads used on a new, horizontal-return extrusion finisher. The unit shown has seven, 20-hp heads to remove die lines and bring up the luster. Its conveyor has platens that accommodate 22-ft long workpieces. The conveyor moves continuously, and is loaded and un-

loaded at production speeds up to 27 fpm. (Hammond Machinery Builders, Inc.)

For more data circle No. 82 on postcard, p. 99

Detects Flaws

A new, gamma-ray, image-intensifier system "sees" flaws in 4-in. thick steel and other dense objects. It also projects an image of these flaws on a television screen. The intensifier tube permits an assembly-line-type of continuous inspection on dense materials. The new system suggests a number of potential uses in steel manufacture. In rolling mills, for example, steel billets form slabs 4-in. thick, 4-ft wide and 10-ft long. The ends of the red-hot slabs are visually inspected for flaws. When flaws are found, the operator shears 6 in. of the slab and inspects again. He continues until no more flaws are seen. On the gamma-ray screen, an operator could watch the slabs of

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WORMS AND WORM GEARS—Worms to 7" dia. Worm gears to 36" dia.

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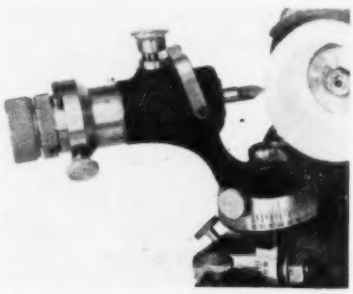
steel as they move off along a conveyor, determine the exact location of each defect, and shear off only as much as necessary. Potential savings are definitely significant. (The Rauland Corp., a subsidiary of Zenith Radio Corp., and the Picker X-Ray Corp.)

For more data circle No. 83 on postcard, p. 99

Cutter Sharpener

This cutter grinder is capable of grinding any profile. It has a universal cutter head which permits the operator to sharpen single lip cutters to any angle or shape, including ball- or round-nose cutters. You don't need to remove the cutter from the collet to get accurate side clearances and tip or end rake. The grinder also has an index unit

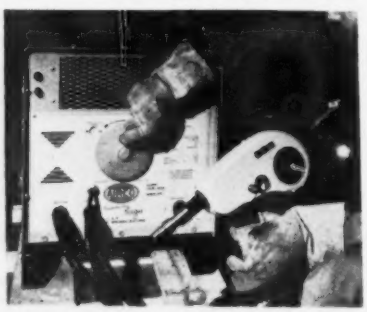


for grinding 3- or 4-sided cutters. (H. P. Preis Engraving Machine Co.)

For more data circle No. 84 on postcard, p. 99

Makes Fast Welds

At low cost, a gas-shielded, metal-arc welding package is avail-



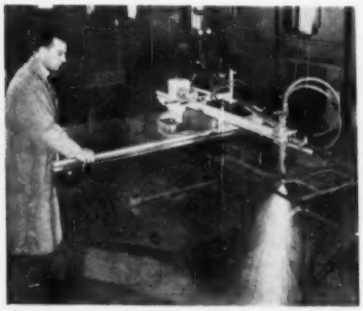
able to industry. It provides versatile and high-speed welding of stainless and mold steels and aluminum. The complete package includes gun and power source. No

separate controls are needed. The gun connects directly to the power source, making operation extremely simple. A single control on the power source adjusts arc voltage, while a handy knob on the gun adjusts wire-feed speed. (Air Reduction Sales Co.)

For more data circle No. 85 on postcard, p. 99

Metal-Cutting Machine

Low in cost, a new metal-cutting machine suits small workshops. It's

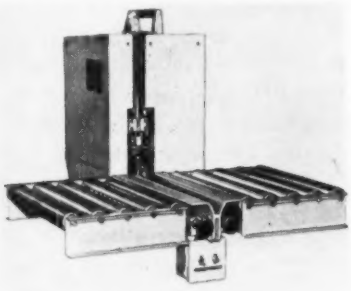


a simple and sturdy unit, that can be operated by unskilled labor. The portable oxycutting machine gives accurate cuts in the performance of automatic production work from steel templates. It also suits square- or bevel-edge, straight-line cutting, hand-guided cutting or compass-guided, circular cutting. (NCG Div., Chemetron Corp.)

For more data circle No. 86 on postcard, p. 99

Steel Strapping Units

In the simplest model of a series of steel strapping machines, a basic

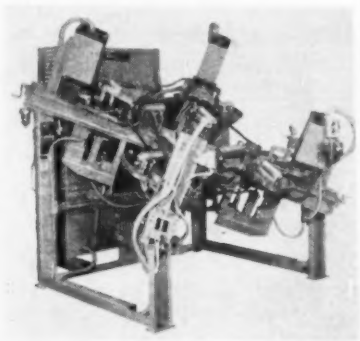


strapping mechanism mounts on the side of a conveyor height stand. It's also has controls for semi-automatic operation. More sophisticated systems or production-line models include full package circling tracks, and controls for fully-automatic strapping. The basic mechanism is self-contained, air-powered and electrically-controlled. It weighs only 75 lb. (Acme Steel Co.)

For more data circle No. 87 on postcard, p. 99

Projection Welder

This multi-gun, inclined projection machine welds hinge brackets

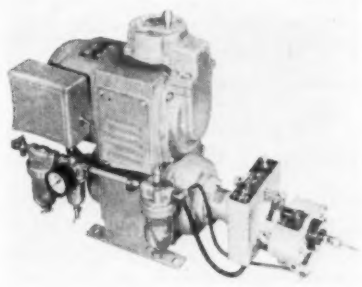


and leg assemblies to the top rim of card-table frames. The machine consists of an inclined frame that mounts four dual welding guns, one for each of the four hinge brackets and leg assemblies. In addition, there's the necessary transformer, clamp, locators and transformer-mounting bracket at each corner. Air, water and electrical accessories, complete with piping, wiring, etc., are provided for proper automatic operation of the welder. Production is 450 assemblies per hr. (The Federal Machine & Welder Co.)

For more data circle No. 88 on postcard, p. 99

Taps Large Holes

Want a class 3 fit every time in your drilling operations? Here's a unit that boasts the ability. A lead-



screw assembly is responsible. It controls the tap. This means the tap is fed into, and reversed out of,

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Indianapolis 2, Indiana

Huron Steel Company
Detroit 16, Michigan

Meier Brass & Aluminum
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The Ohio Metal & Manufacturing Co.
Dayton 2, Ohio

Vorys Brothers, Inc.
Columbus 8, Ohio

Williams and Company, Inc.
Cleveland 14, Ohio
Cincinnati 29, Ohio
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Hubbell Metals, Inc.
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St. Louis 3, Missouri

E. M. Jorgensen Company
Wichita, Kansas

Marsh Steel Corporation
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Savannah, Georgia
Raleigh, North Carolina
Richmond, Virginia

J. M. Tull Metal and Supply Co., Inc.
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Miami, Florida
Tampa, Florida
Atlanta 2, Georgia

Atlantic Steel Company
Atlanta 1, Georgia

Hubbell Metals Inc.
Marietta, Georgia

Hill-Chase Steel Company of Maryland
Baltimore 3, Maryland

Vance Iron and Steel Company
Charlotte, North Carolina

Dominion Culvert and Metal Corp.
Roanoke 5, Virginia

EAST SOUTH CENTRAL STATES

Atlantic Steel Company
Birmingham, Alabama

Reynolds Aluminum Supply Company
Birmingham, Alabama
Louisville, Kentucky
Memphis, Tennessee
Nashville, Tennessee

J. M. Tull Metal & Supply Co., Inc.
Birmingham, Alabama

Hubbell Metals Inc.
Louisville, Kentucky
Memphis, Tennessee

Williams and Company, Inc.
Louisville 3, Kentucky

Mid-State Steel, Inc.
Nashville, Tennessee

Siskin Steel and Supply Company, Inc.
Chattanooga, Tennessee

Vance Iron and Steel Company
Chattanooga, Tennessee

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Little Rock, Arkansas

Marsh Steel Corporation
Baton Rouge, Louisiana

E. M. Jorgensen Company
Tulsa 5, Oklahoma
Dallas 22, Texas
Houston 1, Texas

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E. M. Jorgensen Company
Denver, Colorado
Phoenix, Arizona

Marsh Steel Corporation
Denver 16, Colorado

Pacific Metal Company
Boise, Idaho

Structural Steel and Forge Co.
Salt Lake City, Utah

PACIFIC STATES

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Los Angeles, California

Ducommun Metals & Supply Co.
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Los Angeles 54, California
National City, California
Seattle 8, Washington

E. M. Jorgensen Company
Los Angeles 54, California
Oakland 23, California
Seattle 24, Washington

American Steel Warehouse Co.
Portland 14, Oregon

Pacific Metal Company
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Seattle, Washington

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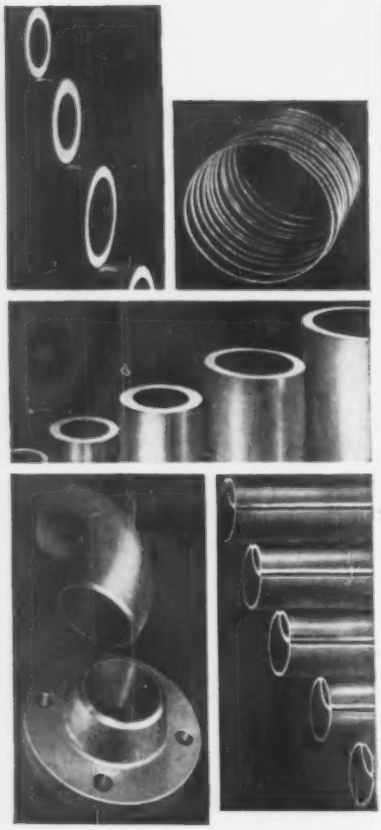

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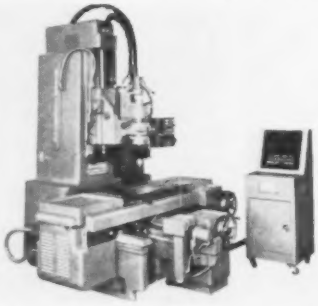
the work automatically, without any pressure from the operator. The result is controlled uniformity, and precision that never varies. In addition, it practically does away with broken taps and stripped threads. The smooth, air-operated action of the tap also eliminates the need for complicated fixtures, hold-down clamps and strippers. (Procunier Safety Chuck Co.)

For more data circle No. 89 on postcard, p. 99

Numerical Control

Many a manufacturer doing jig boring or jig grinding likes the speed and accuracy of numerical control, but feels he can't justify a full tape-control setup. Here's a new unit that let's him go halfway. It's a basic numerical system, with

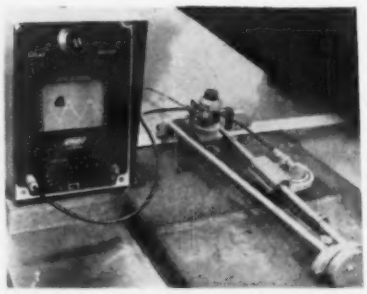


the substitution of manual input for tape input. Otherwise, the control is similar to tape control. It's housed in a separate console, displaying on its face a series of numerical dials. The operator sets the coordinates of the next operation on these dials. The machine moves to the new location at the touch of a button, as soon as the previous operation is finished. (Fosdick Machine Tool Co.)

For more data circle No. 90 on postcard, p. 99

Inspects Welds

Here's a brand new idea in weld inspection: Scanning with ultrasonic test equipment. Basically, the detector sends bursts of sound into the welded plate. Then it picks up the returning echo. Under normal conditions, the pattern on the cathode-ray tube shows a series of pyramid markers. These are an exact replica of the sound beam within

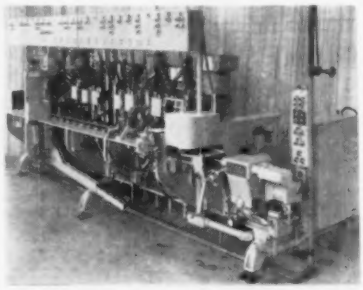


the plate and weld. However, if the sound wave meets any obstacle in its path, such as a slag inclusion, lack of fusion or hairline crack, the discontinuity generates a vertical pip on the scope at the exact flaw location. (Branson Instruments, Inc.)

For more data circle No. 91 on postcard, p. 99

Transfer Line

With standard machines and movements, an automatic transfer line can be changed from one assembly to another in only a few minutes. This line features individual shot pinning for accurate fixture positioning. Protection safeguards eliminate damage when it's



physically impossible for station movements to carry out operations. (Gilman Engineering & Mfg. Co.)

For more data circle No. 92 on postcard, p. 99

Portable Hacksaw

Capacity is 5-in. wide x 4-in. deep on a new, portable, floor-model hacksaw. A fast-acting swivel permits sawing any angle to 45° on material up to 3¼-in. wide. The saw feeds by gravity, but the weight of the rugged saw frame gives fast cutting. (Sales Service Mfg. Co.)

For more data circle No. 93 on postcard, p. 99

Quick Delivery Days Numbered

Time is running out on immediate delivery for many products, although buyers are fighting for the last possible day in placing orders.

The market improvement may be starting to snowball.

■ The strong upturn in the steel market is starting to cut into rush ordering. This is one of the first indications of a "snowballing" effect of the May pickup.

Up to now, steel users are still able to place rush orders for emergency tonnage. But time is running out when consumers can demand, and get, virtually immediate delivery on most products.

Deliveries Strained — For example, speedups in requested delivery of automotive sheet are beginning to strain deliveries of cold-rolled sheet. This may be the first break in the general buyer practice of pushing mills to the limit for fast delivery.

But buyers continue to oppose mill suggestions that rush orders may not always be filled. And they have some good arguments. Some mills that have not shared fully in the upturn in new business are promising even shorter delivery dates to get the business. But more and more frequently, emergency tonnage is being placed out-of-district when usual sources can't deliver on the spot.

Automotive Questions—Automotive steel orders for May and June have been the strong point in the current upturn. But farm implement makers, appliance manufacturers, and service centers have contributed to the 10 pct pickup in overall business for May.

The outlook for June is for a continued gain, but with one hedge. Although automotive production schedules look good through the first half, June orders for steel will hinge on auto sales this month. If they fail to hold up, large tonnages for June will be held up or canceled.

The market is not likely to break wide open. Improvement, while healthy, is gradual. But this week the bullish notes stand out as steelmen apparently feel their first real confidence.

Quarterly Outlook—Even so, the summer effects of vacations and automotive model changeovers will cut into July and possibly August. Although a quarter-by-quarter pickup is forecast the market will likely level out at the June rate for some weeks, then pick up again midway through the third quarter.

Auto Schedules — Furthermore, automotive produuction schedules give them something to cheer about —providing sales back up production estimates.

Automakers are planning to average 525,000 cars a month in May and June for a second quarter of about 1.5 million. This compares with a second quarter, 1960 of 1.8 million, but is a decided improvement over the 1,188,000 cars produced in the first quarter.

For further comparison, April car production hit about 450,000. So the May-June schedule will amount to better than a 17 pct increase in auto production this month.

The poor earnings of the first quarter again focus attention on prices and the industry is sweating out a price squeeze. But, at the same time, most industry leaders concede that prices can not be increased under current market conditions.

District Steel Production Index 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	103	101	100	120
Buffalo	100	92	80	118
Pittsburgh	90	87	82	117
Youngstown	84	78	65	97
Cleveland	105	95	90	123
Detroit	113	107	104	146
Chicago	102	97	96	125
Cincinnati	103	98	89	119
St. Louis	113	105	110	108
Southern	94	104	100	118
Western	121	116	107	111
U. S. Index	99.7	95.8	91.0	118.6

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,858	1,784	27,044	43,740
Ingot Index				
(1957-59=100)	99.7	95.8	85.4	138.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$36.50	$37.50	$39.50	$33.17
No. 2 bundles	$24.17	$25.17	$27.50	$23.17

Purchasers Evaluate Salesmen

A. O. Smith Corp. recently conducted a survey among its purchasing men. Purpose: to gauge salesmen efficiency.

The results show many salesmen are missing the boat when it comes to buyers' needs.

■ When it comes to value analysis, salesmen exhibit little or no knowledge of the concept. And it hurts their sales.

This is the opinion of one group of purchasing men. A. O. Smith Corp. recently conducted a survey among its purchasing agents.

Purpose: "To take a long, hard look at the salesmen calling on them day after day."

Result: A formula against which salesmen can gauge their own performance and efficiency. The survey results will also be used by Smith Corp. to upgrade its own sales force.

A. F. Smith, director of marketing at A. O. Smith, points out that participants represent "a good cross-section of purchasing experience, geographically scattered and exposed to thousands of salesmen over a period of years."

No Cure-All—But, he says, the survey is not meant to be a "golden formula against which all salesmen will be able to find the solution to their problems.

"It is, however, an honest attempt to catalogue the broad impressions of a knowledgeable group associated with the sales field—a field which is receiving intensified emphasis as competition continues to increase."

The survey was broken down into five general categories: Personality and habits, approach, sales presentation, follow-through, and general.

Wasted Time—In the first category, 76 pct of the purchasing men feel salesmen waste too much time with idle talk. Fifty-two pct say salesmen talk too much; they lack enthusiasm, note 34 pct of the buyers.

About 14 pct of those surveyed say salesmen are not prompt; another 14 pct claim salesmen don't call often enough and 10 pct say they call too often.

When the buyers rated the approach techniques, this was their consensus: Salesmen lean too heavily on personal friendship; some try to by-pass the purchasing men to reach engineers and production managers; others rely on influence and pressure.

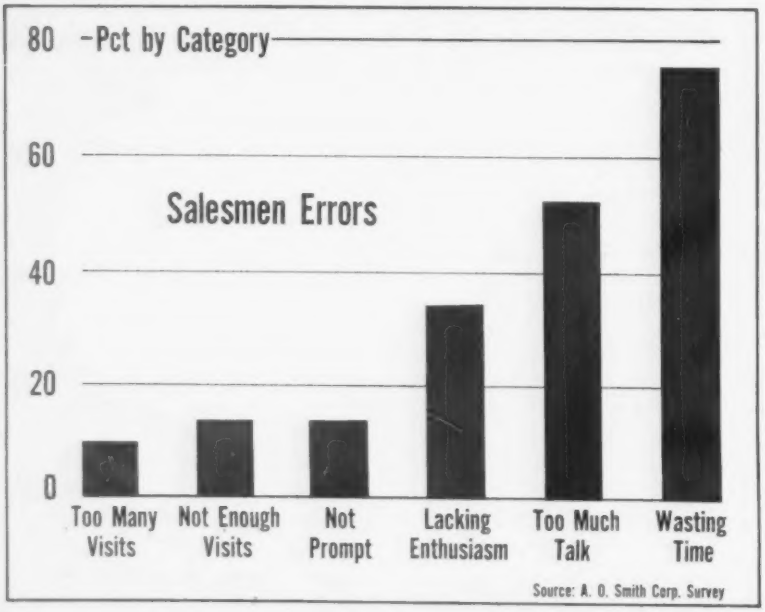
Also, 14 pct of the buyers say salesmen think they can "buy you with a lunch." Others rely on price alone.

Impressions—The study of sales presentations points up what A. O. Smith terms "interesting impressions." Seventy-three pct of the buyers claim salesmen don't try to find out about the customer's problems. Another 41 pct complain sales personnel don't really know their product. Other comments from the buyers note that some salesmen can't present an effective message, are "mere order takers," or can't even take an order.

Salesmen also feel subject to severe criticism in the follow-through category of the survey. Here purchasers complained that many salesmen fail to follow the status of an order.

When to Call—The purchasing agents at A. O. Smith generally feel salesmen should call once a month. However, 20 pct of the buyers said every two weeks; 7 pct said every two months.

Wasted Time Leads Criticism



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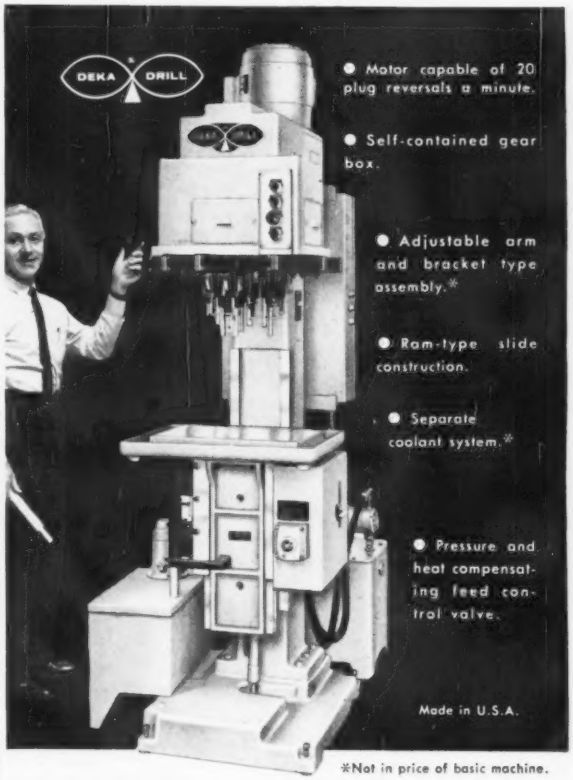
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Tinplate, Galvanized Get Added Boosts

Tinplate and galvanized steel are two of the hottest products in a luke-warm market.

For this reason, mills are devoting extra attention to them in their expansion and research budgets. It pays off.

■ Coated products, particularly thin tinplate and galvanized, are receiving additional attention these days. The result: Better products and greater capacity.

National Steel Corp. is equipping its new Midwest plant for full commercial production of thin tinplate.

Due for startup in 60 or 90 days, Midwest's tinplate facility will have a two-stand temper mill for reducing coated plate. This mill will have capacity to put its entire tinplate output as double-reduced.

First Word — This is the first official word on commercial facilities for thin tinplate. Until now, most production has been on a limited basis with improvised or converted facilities.

Regarding the cost of the extra operation and its relation to pricing, the company indicates weight savings more than offset added work. Conventional tinplate averages about 23 boxes to a ton of steel, compared with 33 to 35 boxes for thin tinplate.

New Process — Bethlehem Steel Co. has revealed that engineering has begun on plans for a new sheet galvanizing department to make a wider range of heavy-gauge galvanized sheets at its Lackawanna plant.

Dow Chemical Co. says it has developed an improved process for hot-dip galvanizing. The company says corrosion protection is improved 20 pct to 90 pct "when magnesium is present in the amounts of 0.04 pct to 0.05 pct by weight in the galvanizing bath." The coating, under test since 1955, produces a satin-white silver appearance, depending on the amount of aluminum in the bath.

Armco Steel Corp. recently announced a new zinc-coated steel which it claims has better paintability than regular galvanized. (IA —Apr. 27, '61, p. 162). New facilities were part of the program.

Sheet and Strip — Automotive improvement is making itself felt from **Pittsburgh** on west. But the optimism and orders are less noticeable along the **East Coast.** One stamping plant in **Pittsburgh** has boosted its production from 58 pct of normal a short time ago to 90 pct of normal now. It has already placed a second order for May, adding 40 pct to its original tonnage.

At least one automaker is pressing **Cleveland** mills for fast delivery. And **Detroit** reports that a number of June orders are being pushed ahead for delivery in May. But that leaves open the question of what will happen in June; reports vary from "slow" to "good."

PURCHASING AGENT'S CHECKLIST

Copper price situation is unsettled. P. 57

New ideas in designing with structurals developed by U. S. Steel. P. 59

How explosives weld metals. Success in metal forming triggers interest in joining. P. 86

There is a general pickup in orders from appliance and farm equipment makers in the **Midwest** as well as in auto orders. This is beginning to push up cold-rolled sheet operations at **Chicago** mills. And this is expected to boost mill operations in May by as much as the April gain, which was the largest so far this year.

Bars—Gains chalked up for sheet and strip products are also felt by bar producers. Higher automotive schedules are boosting the demand for forging bars, say **Cleveland** mills. This is substantiated by reports from sales offices in **Detroit.** Construction is gaining momentum in the **Midwest.** Demand for reinforcing bars is felt in **Chicago.** However, nearly all bar activity is on a rush basis and there seems to be little inventory rebuilding.

Pipe and Tubing — The outlook remains mixed. A pipe mill in the **Pittsburgh** area reports April sales up from March. Gains have been made in both oil country seamless and standard pipe. The mill considers the small improvement as an encouraging sign because of its broad base. However, Republic Steel Corp. is shutting down its large-diameter pipe mill in **Alabama** for six weeks, until mid-June, because of the low level of business. And **Cleveland** mills say small-diameter pipe is moving to distributors, but still hasn't experienced a normal seasonal upturn.

Wire—The seasonal upturn has started for a number of wire products, according to **Cleveland** mills. Merchant products are showing gains due to increased demand for farm and construction use. Automakers in **Detroit** have spurred gains in manufacturers wire for upholstery. And roadbuilding and other construction activity is boosting demand for welded wire fabric.

Stainless — Over the past two weeks, automotive orders have zoomed. **Pittsburgh** mills say auto plants have taken small orders that were spread out over a number of months and have pulled them back into current periods.

COMPARISON OF PRICES

(Effective May 1, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	May 1 1961	Apr. 24 1961	Apr. 3 1961	May 3 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	May 1 1961	Apr. 24 1961	Apr. 3 1961	May 3 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$34.50*	$35.50	$36.50	$34.50
No. 1 steel, Phila. area	39.50	39.50	42.50	34.50
No. 1 steel, Chicago	35.50*	37.50	39.50	30.50
No. 1 bundles, Detroit	33.50	33.50	34.50	30.50
Low phos. Youngstown	37.50*	38.50	40.50	36.50
No. 1 mach'y cast, Pittsburgh	45.50	45.50	45.50	50.50
No. 1 mach'y cast, Phila.	49.50*	50.50	50.50	51.50
No. 1 mach'y cast, Chicago	47.50*	49.50	51.50	51.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$36.50*	$37.50	$39.50	$33.17
No. 2 bundles	24.17	25.17	27.50	23.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	33.00
Copper, Lake, Conn.	29.00	29.00	29.00	33.00
Tin, Straits, N. Y.	107.75†	108.375**	100.50	99.25
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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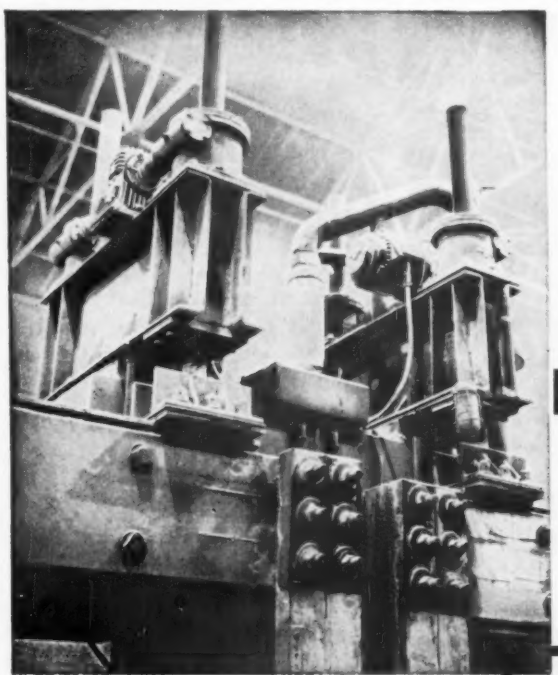
*Appears in the April 27-May 11 issues.



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Market Falls To Adjustment Point

The scrap market took another dip this week. Many scrapmen say it is approaching a realistic level.

Strong export demand is no longer apparent and the market must move accordingly.

■ While steel demand and production continue to rise, scrap demand and prices continue to drop. This is the fifth straight week of falling prices and a weakening market.

Nevertheless, many scrapmen say the market is settling to an adjustment point. They claim unusually strong export demand at the beginning of the year forced prices to the brink of a runaway. Now that export interest has eased, prices are returning to a "more realistic range."

Domestic interest is still missing. There were only scattered mill purchases around the country this week. And these were for limited tonnage.

The Chicago market slipped $2 to $3 this week after major declines in two major factory bundle lists. Mills there resumed the practice of direct bidding on some factory lists.

The IRON AGE composite price for No. 1 heavy melting is down to $36.50 this week. The composite price for No. 2 bundles fell to $24.17.

Pittsburgh—The general market decline has been confirmed by industrial and mill activity. On a local list, factory bundles sold for about $4 under last month's price. In the dealer market, a mill on the fringe of the district came out with a price of $35 to the dealer for No. 1 heavy melting. A local mill has dropped to $25 for No. 2 bundles. The market seems to be settling back to the levels it had reached before export pressure was applied.

Chicago—Rocked by drops in two major factory bundle lists, the Chicago market slipped $2 to $3. Mills have resumed the practice of bidding direct on some factory lists. Factory bundles actually moved to a mill at a little over $39. However, brokers captured the largest tonnage offered. Even the badly depressed turnings price slipped slightly. A mill purchase of $16 for machine shop turnings was followed almost immediately by small purchases at a reduced figure.

Philadelphia—Export shipments are still strong and May is expected to reflect a continuing of this activity. But these shipments are based on orders made before the price decline started. Domestic support is again weak. Scrapmen here don't look for local buyers to come into the market for anything more than limited tonnage.

New York—Steelmaking grades are off $1 on a combination of factors. Dealers are fairly busy filling old orders. But new orders are slow.

Detroit—Scrap appears to have a market at current levels. Some forecasters expect relative stability for the next month or so. Although the May industrial list was down, the last day of bidding took a slightly stronger tone than early lists. Local mills indicate the market is in an area where trading can be done willingly if operations gain.

Cleveland—Market is off another $1 as two Valley mills entered the market in the wake of lower auto lists. Lists sold at about $35 on the track; some low enough to move out of the district. One Valley mill bought low phos scrap at $37 and another bought No. 1 heavy melting at $37.

Cincinnati — Major area mills made purchases for the month at $2 less on No. 1 dealer grades and $1 less on some secondary grades. Some No. 2 bundles are also being taken in the area for the first time in recent months. Foundries are still very quiet.

St. Louis—The market seems to have reached a leveling off period. Mill buying is light due to recent outside purchases and heavy inventories. No one seems to be worried about the present condition.

Birmingham — An Atlanta mill bought No. 2 heavy melting at $2 under its last purchase. Otherwise, there is limited buying and brokers say the market appears weak. Cast iron pipe manufacturers are out of the market.

Buffalo—A sale for small tonnage of some openhearth grades was made at the quoted prices. Despite slumps elsewhere, prices are holding up in this market.

Boston — There are no price changes this week as activity continues fair. However, there are reports of some weakening and drops are expected.

West Coast—Despite continued brisk export demand, there's a tendency toward softer prices. Major mills plan to stay out of the market again during May in the San Francisco area. Token purchases are expected in Los Angeles. Meanwhile, Seattle prices hold firm.

Houston—With the district mill deciding to stay out of the market for at least two weeks, general price declines set in. Export picture is better with Mexico in the market.

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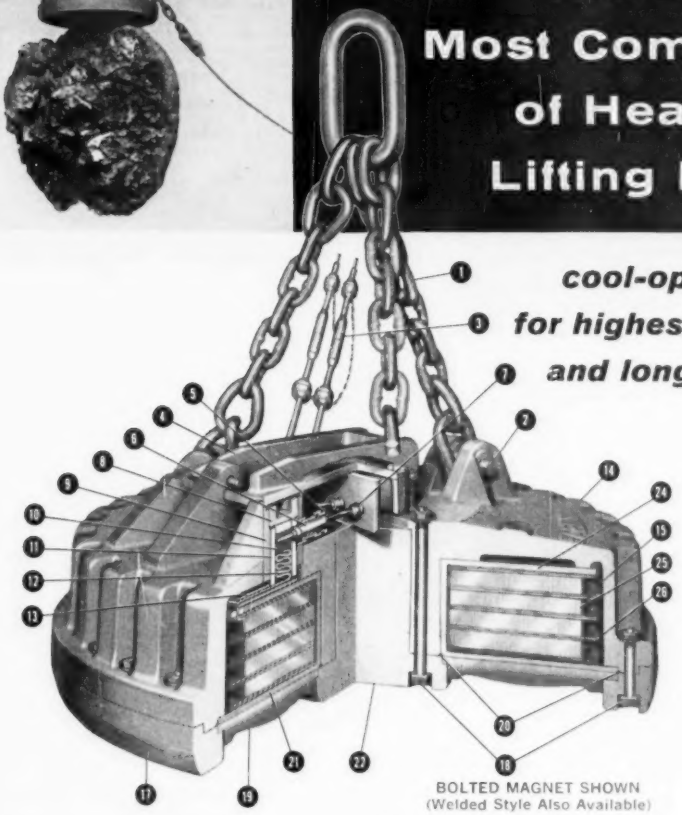

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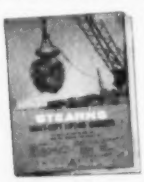

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SCRAP PRICES *(Effective May 1, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy melting	29.00 to 30.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	40.00 to 41.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth	46.00 to 47.00
Rails, 2 ft and under	50.00 to 51.00
RR specialties	41.00 to 42.00
No. 1 machinery cast	45.00 to 46.00
Cupola cast	38.00 to 39.00
Heavy breakable cast	35.00 to 36.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	100.00 to 110.00
430 bundles and solids	80.00 to 85.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	39.00 to 41.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	43.00 to 44.00
Low phos. punch'gs plate, ½ in. and heavier	41.00 to 42.00
Low phos. 2 ft and under	39.00 to 40.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth	46.00to 47.00
Rerolling rails	57.00 to 58.00
Rails 2 ft and under	49.00 to 50.00
Angles and splice bars	44.00 to 45.00
RR steel car axles	57.00 to 58.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast	47.00 to 48.00
Cupola cast	42.00 to 43.00
Cast iron wheels	34.00 to 35.00
Malleable	46.00 to 47.00
Stove plate	37.00 to 38.00
Steel car wheels	42.00 to 43.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	90.00 to 95.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft punch'gs	44.00 to 45.00
Elec. furnace bundles	42.00 to 43.00
Heavy turnings	27.00 to 28.00
RR specialties	44.00 to 45.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	39.00 to 40.00
Cast iron car wheels	42.00 to 43.00
Malleable	48.00 to 49.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	37.00 to 38.00
Rails, random length	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast	34.00 to 35.00
Heavy breakable cast	28.00 to 29.00
Drop broken cast	45.00 to 46.00

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Low phos. plate	37.00 to 38.00

Cleveland

No 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	32.50 to 33.50
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	21.50 to 22.50
No. 1 busheling	32.50 to 33.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Cut structural & plates, 2 ft & under	37.00 to 38.00
Low phos. punch'gs plate	33.50 to 34.50
Drop forge flashings	32.50 to 33.50
Foundry steel, 2 ft & under	32.00 to 33.00
No. 1 RR hvy. melting	37.50 to 38.50
Rails 2 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
Steel axle turnings	26.00 to 27.00
Railroad cast	47.00 to 48.00
No. 1 machinery cast	47.00 to 48.00
Stove plate	38.00 to 39.00
Malleable	50.00 to 51.00
Stainless	
18-8 bundles	170.00 to 175.00
18-8 turnings	100.00 to 105.00
430 bundles	85.00 to 90.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth	38.00 to 39.00
Rails 2 ft and under	48.00 to 49.00
No. 1 machinery cast	44.00 to 45.00
No. 1 cupola cast	38.00 to 39.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft	31.00 to 32.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	14.50 to 15.50
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	36.00 to 37.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	43.00 to 44.00
RR specialties	39.00 to 40.00
Cupola cast	38.00 to 39.00
Heavy breakable cast	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	54.00 to 55.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	36.50 to 37.50
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	43.00 to 44.00
Structural and plate, 2 ft	42.00 to 43.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rail, random lgth	40.50 to 41.50
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	42.00 to 43.00
No. 1 cupola cast	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	35.00 to 36.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	5.00 to 6.00
Mixed bor. and turn.	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	20.00 to 21.00
No. 1 machinery cast	38.00 to 39.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	29.00 to 30.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	11.00 to 12.00
Heavy breakable cast	28.00 to 29.00
Mixed cupola cast	33.00 to 34.00
Automotive cast	40.00 to 41.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	4.00 to 4.50
Shoveling turnings	9.50 to 10.00
Clean cast. chem. borings	15.50 to 16.50
No. 1 machinery cast	40.00 to 41.00
Mixed cupola cast	32.00 to 32.50
Heavy breakable cast	28.00 to 29.00

San Francisco

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	30.00
No. 2 bundles	25.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast	$45.00 to 46.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	31.00
No. 2 bundles	27.00
Machine shop turn.	15.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furnace 1 ft and under (foundry)	$48.00 to 50.00
No. 1 cupola cast	45.00 to 46.00

Seattle

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 2 bundles	25.00
No. 1 cupola cast	36.00
Mixed yard cast	31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$31.00
No. 2 hvy. melting cut 3 ft and under	28.00
No. 1 dealer bundles	31.00
No. 2 bundles	21.00
Mixed steel scrap	23.00
Bush., new fact., prep'd	31.00
Bush., new fact., unprep'd	25.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	24.00
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$49.00 to 50.00
Unstripped motor blocks	29.00 to 30.00
Cupola cast	35.00 to 36.00
Heavy breakable cast	29.00 to 30.00

Here's a man who's ready to help you with a roll problem

But you don't need to have a roll problem to have a visit from Bill Curran, General Manager at National Roll. To the contrary, the "boss" spends a lot of his time with customers discussing their operations and roll requirements before problems have an opportunity to develop. This is typical of the personal interest National takes in helping customers get the benefits of maximum roll performance. For personal attention to *your* roll requirements, whether steel, iron or nodular iron, order from National. You'll see why . . . NATIONAL'S THE GROWING NAME IN ROLLS.

NATIONAL ROLL & FOUNDRY DIVISION
GENERAL STEEL INDUSTRIES, INC., Avonmore, Pennsylvania
General Steel Industries, Inc., General Offices: Granite City, Ill. Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.
Subsidiary: St. Louis Car Company, St. Louis, Mo.

Government Blocks Aluminum Mergers

The Justice Dept. has filed suits to halt acquisitions of two major aluminum producers.

Kaiser and Alcoa have been cited for acquiring smaller companies in the architectural metals industry.

■ The Federal Government has definitely moved to halt the apparent trend of aluminum producers to move closer to their final customers through acquisitions and mergers with fabricators.

Last week the Justice Dept. filed separate suits against Aluminum Co. of America and Kaiser Aluminum & Chemical Corp. for acquiring small companies in the architectural metals field.

Stock Deals — Alcoa acquired Cupples Products Corp., St. Louis, in January of 1960 in a stock transaction.

In February of this year, Kaiser and Kawneer Co. of Niles, Mich., agreed to merge with Kaiser stock to be issued for Kawneer. The deal is incomplete.

Third Suit—Later in the week, the Justice Dept. moved to force Kaiser to give up a wire and electrical conductor plant it acquired from U. S. Rubber Co. in 1957. The government charges this acquisition substantially lessened competition in the electric conductor field; eliminated competition between Kaiser and U. S. Rubber in the aluminum wire and cable field; and lessened competition between Kaiser and other smaller companies which fabricate products.

In April, 1960, the Justice Dept. brought similar anti-merger action against Alcoa for its 1959 acquisition of Rome Cable Corp., New York. This case is slated to go to trial in the fall.

Closer Look—It may take years to resolve the issue if the aluminum companies decide to fight. Initial industry reaction is the major companies may have to reappraise some of their ideas on expansion.

Kaiser claims it had to take the Kawneer step. A spokesman says Kaiser's competitors, Alcoa and Reynolds Metals Co., were heavily committed in the booming architectural metals field. Kaiser felt it had to team with Kawneer to remain competitive.

Bid Refused—The Kaiser official says the company tried to get an opinion from the Justice Dept. before the merger move, but was turned down.

Reynolds Metals has not been cited by the Justice Dept. Reynolds organized its efforts in building products within the company. It began making some products in 1946, and became active in others, such as curtain walls, in 1955.

Justice Charge—In its suits, the government claims: If such acquisitions are allowed, they would change the architectural metals business "from one composed of many small non-integrated fabricators to one dominated by the three large fully-integrated primary producers."

Indications of industrial trouble came six weeks ago. In March, Alcoa Vice President M. M. Anderson referred to "destructive price cutting" in a West Coast speech. Small companies in the building products field were sure then a price war was brewing. They pointed to the major producers putting more time, money and energy into building products.

Alcoa Role—Two of the Justice Dept. suits were filed in St. Louis. Most attention will focus on Alcoa since it is the home of Cupples, the Alcoa acquisition. Kaiser has only a small sales office there.

The law permits the government to file suit in any city in which the defendant maintains representation. In practice, suits are usually filed in the home city of a company to facilitate calling witnesses.

No Comment—There has been no official statement by Alcoa or Kaiser yet. A Kaiser spokesman reports his company will probably stop action in the Kawneer merger until the Alcoa case is settled.

Alcoa is faced with a greater problem. Cupples hasn't existed as a corporate entity since last year.

Tin Prices for the Week

April 25—108.125; April 26—108.00; April 27—107.875; April 28—107.875; May 1—107.75.*

* Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	29.00	30.00	1/16/61
Copper (CS)	30.00	29.00	5/1/61
Copper (L)	29.00	30.00	1/16/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colborne, Canada. **ZINC:** prime western. Other primary prices, pg. 131.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	55.32
Brass, Yellow	48.10	48.39	48.04	52.26
Brass, Low	50.65	50.94	50.59	54.71
Brass, Red	51.54	51.83	51.48	55.60
Brass, Naval	52.86	59.17	46.67	57.02
Muntz Metal	50.94	.....	46.25	.....
Comm. Bz.	52.98	53.27	52.92	56.79
Mang. Bz.	56.80	.....	50.20	.....
Phos. Bz. 5%	54.59	74.34	75.09	76.52

Free Cutting Brass Rod 33.71

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb.....57.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$204 to $207
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz...$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg $43.00
Vanadium .....$ 3.65
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.00
- No. 120 ..... 29.25
- No. 123 ..... 28.50

80-10-10 ingot
- No. 305 ..... 34.00
- No. 315 ..... 31.75

88-10-2 ingot
- No. 210 ..... 41.75
- No. 215 ..... 38.50
- No. 245 ..... 33.75

Yellow ingot
- No. 405 ..... 25.50

Manganese bronze
- No. 420 ..... 29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.25-24.50
- 0.60 copper max. 24.00-24.25

Piston alloys (No. 132 type)...26.00-27.00
No. 12 alum. (No. 2 grade)...22.75-23.25
108 alloy 23.25-23.75
195 alloy 25.75-26.75
13 alloy (0.60 copper max.)...24.00-24.25
AXS-679 (1 pct zinc) 23.00-24.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 23.75-24.75
- Grade 2—92-95% 22.50-23.50
- Grade 3—90-92% 21.50-22.50
- Grade 4—85-90% 21.00-22.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24¼
Yellow brass	19¼	17⅜
Red brass	22¼	21½
Comm. bronze	23	22¼
Mang bronze	18⅛	17⅜
Free cutting rod ends.	18⅜	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27
- No. 2 copper wire 25¼
- Light copper 23
- *Refining brass 24
- Copper bearing material 23

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27
- No. 2 copper wire 25¼
- Light copper 23
- No. 1 composition 23
- No. 1 comp turnings 22½
- Hvy yellow brass solids 17
- Brass pipe 16
- Radiators 18

Aluminum

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13½—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 24 —24½
- No. 2 copper wire ..... 22 —23
- Light copper ..... 20 —20½
- Auto radiators (unsweated).. 15¾—16¼
- No. 1 composition ..... 19¼—19¾
- No. 1 composition turnings .. 18¼—18¾
- Cocks and faucets ..... 16¼—16¾
- Clean heavy yellow brass .... 12¾—13¼
- Brass pipe ..... 16¼—16¾
- New soft brass clippings .... 15¾—16¼
- No. 1 brass rod turnings .... 15¾—16¼

Aluminum

- Alum. pistons and struts .... 7 — 7½
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 12¼—12¾
- Old sheet and utensils ..... 9½—10
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 11 —11½

Zinc

- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 3½— 4
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1¾— 2

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 23-23.50
- Clean Monel turnings 16.50-17
- Old sheet Monel 22-23
- Nickel silver clippings, mixed. 18
- Nickel silver turnings, mixed. 15

Lead

- Soft scrap lead ..... 7¼— 7¾
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 78 —79
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 44 —45
- Mixed common babbitt ..... 9½—10
- Solder joints ..... 14½—15
- Small foundry type ..... 8½— 9
- Monotype ..... 8¾— 9¼
- Lino. and stereotype ..... 8 — 8¼
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2 — 2½

(Effective May 1, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$93.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I5, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective May 1, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*				Holloware Enameling 29 ga.—7.85 *U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City.		
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective May 1, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.		5.675 *B3*									
	Fairless, Pa.	5.825 *U1*	5.825 *U1*									
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*		7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*	5.00 *A8*									8.00 *A8* 8.35 *M4*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective May 1, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery: Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	7.87	9.71	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	16.76	16.65	.....	.....
Boston	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.79	16.79	21.89	21.14
Buffalo	.15	8.70	9.45	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58[4]	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		10.17	10.98	11.35[3]	11.73	9.41	9.81	9.58	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	11.20	12.20	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.13	10.50	10.95	11.44	9.47	9.82	8.97	12.89	.....	.....	.....	.....
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.24	20.49
New York	.10	9.77	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.90	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		9.45	11.30	12.35	12.40	10.55	11.00	9.45	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.27	11.79[2]	11.50	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.75	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—½" x 1"; Plate—¼ x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅜" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅜" round.

†† 13e zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective May 1, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R5*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R5*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	6..00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R5*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T5*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T5*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S5*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — *Pct*

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — *Pct*

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

f.o.b. mills

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	--	19.25-21.50	—	19.75-21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25-26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00-31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25-29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*, Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S15*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R3*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R3*; Reading, Pa., *C2*, Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*, Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*, Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge, Pa., *B7*; Midland Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	198	...	...	198	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Chicago *W7*	173	...	...	...	...	9.00	9.55†
Cleveland *A6*	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	9.00	...
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.90
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	...
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
SparrowsPt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	...

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

(Effective May 1, 1961)

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

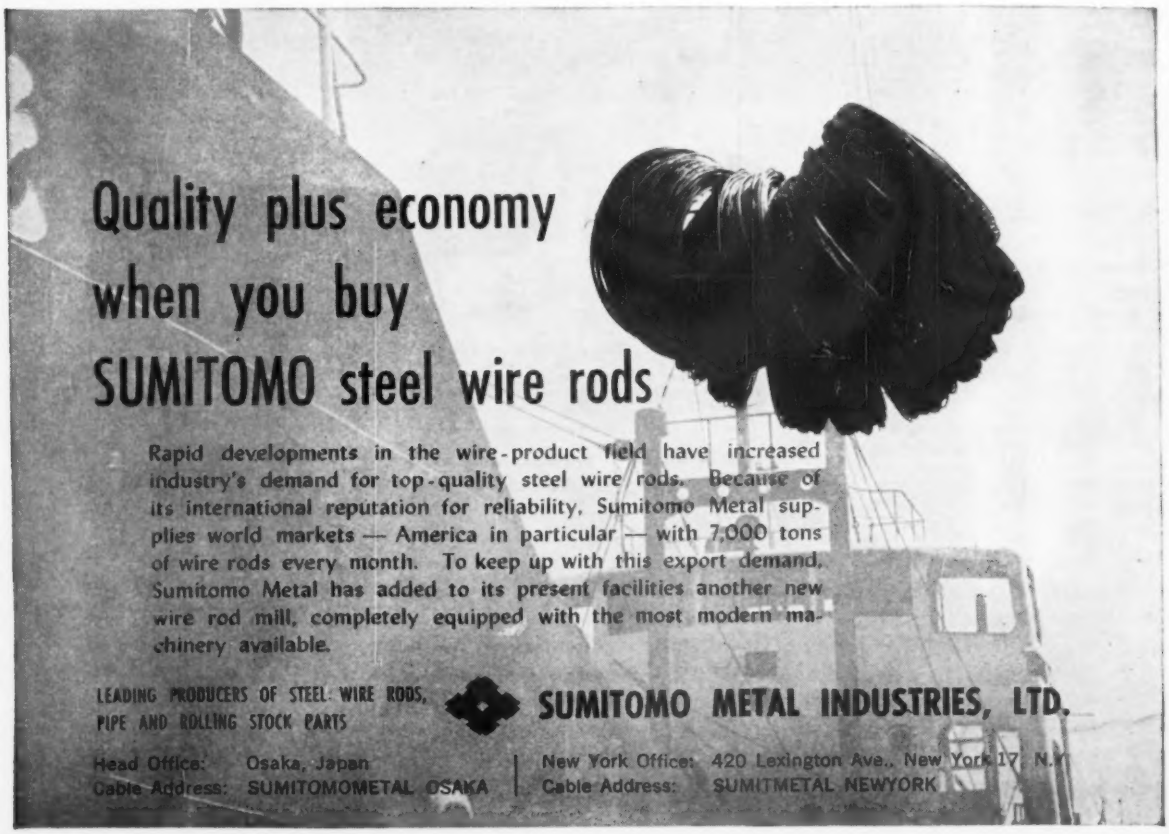
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75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when you buy
SUMITOMO steel wire rods
Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods. Because of its international reputation for reliability, Sumitomo Metal supplies world markets — America in particular — with 7,000 tons of wire rods every month. To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.
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SUMITOMO METAL INDUSTRIES, LTD.
Head Office: Osaka, Japan
Cable Address: SUMITOMOMETAL OSAKA
New York Office: 420 Lexington Ave., New York 17, N.Y.
Cable Address: SUMITMETAL NEWYORK

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25			
Cleveland *R3*						15.35
So. Chicago *R3*				10.10		
Ensley *T2*	5.75	6.725				
Fairfield *T2*		6.725		10.10	6.875	
Gary *U1*	5.75				6.875	
Huntington, *C16*		6.725				
Ind. Harbor *I3*				10.10		
Johnstown *B3*		6.725				
Joliet *U1*			7.25			
Kansas City *S2*				10.10		15.35
Lackawanna *B3*	5.75	6.725	7.25		6.875	
Lebanon *B3*			7.25			15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *N4*						15.35
Pittsburgh *J3*				10.10		
Seattle *B2*					6.75	15.85
Steelton *B3*	5.75		7.25		6.875	
Struthers *Y1*				10.10		
Torrance *C7*					6.75	
Williamsport *S5*		6.725				
Youngstown *R3*				10.10		

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10				
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Beaton *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A3*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *C4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *R3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 42.50
Electrodeposited, 5000 lb lots ... 35.50
OFHC anodes ..... 40.50 to 43.50 (depending on shape)
Brass, 80-20, ball anodes, 2000 lb or more 50.50
Zinc, ball anodes, 2000 lb lots ..... 18.75 (for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb ..... 1.0225 (Rolled depolarized add 3¢ per lb)
Cadmium, 5000 lb 1.50
Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90
Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45
Nickel sulfate, 5000 lbs 29.00
Nickel chloride, freight allowed, 100 lb 45.00
Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 24.00
Zinc cyanide, 100 lb, N. Y. 60.75
Potassium cyanide, 100 lb drum N. Y. 45.50
Chromic acid, flake type, 10,000 lb or more, N. Y. 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
Carbonyl Iron (200 lb lots) 88.00
Welding Grades 8.10
Cutting and Scarfing Grades 9.85
Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades
Electrolytic, domestic, f.o.b. shipping point. 15.00†
Atomized ..... 42.3 to 60.3
Reduced ..... 15.00†
Chemically Precipitated 43.5
Brass, 5000-lb lots ..... 32.3 to 48.9
Bronze, 5000-lb lots ..... 50.3 to 54.2
Chromium, electrolytic 5.00
Lead ..... 7.50†
Manganese, electrolytic ... $1.00
Molybdenum ..... $3.60 to $4.35
Nickel $1.15
Carbonyl Nickel, 20,000 lb lots $1.01
Nickel-Silver, 5000 lb lots.. 57.9 to 65.9
Silicon 70.00
Solder ..... 7.00†
Stainless Steel, 316 ..... $1.07
Stainless steel 304 ..... 89.00
Tin ..... 14.00†
Titanium, 99.25 + pct, per lb, f.o.b. $11.25
Tungsten, carbide grades... $3.25
Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.875	
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor		12.475	
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*)· Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	
	410	22.70	24.85	27.00	
	430	23.45	25.65	27.90	

CR Strip (S9) Copper, 10 pct, 2 sides, $43.00; 1 side, $36.10.

(Effective May 1, 1961)

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
Super duty, Mo., Pa., Md., Ky....	$185.00
High duty (except Salina, Pa., add $5.00)	133.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk...	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays	163.00
Chicago District	168.00
Western Utah	183.00
California	185.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O.	163.00-168.00
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union, Pa.	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Standard chemically bonded, Baltimore, Md.	$620.00
Gary, Ind.	658.50
Standard, Pascagoula, Miss.	647.50
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Baltimore	585.00

Magnesite Brick

Standard, Baltimore	$715.00
Chemically bonded, Baltimore	655.00
Chemically bonded, Pascagoula, Miss.	682.50

Grain Magnesite

St. ⅝ to ½-in. grains

	Per net ton
Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b., Pascagoula, Miss...	80.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:

Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

* Electricweld only.

DATA
18 units with 64 spindles
60-inch index table
12 work fixtures

Single Kingsbury combines 64 operations

Cuts cost-per-part, space, banks of parts

One machine, 64 operations, 180 parts per hour gross. All this cuts the cost per part. It saves floor space. It reduces banks of parts in process.

A rate of 180 parts per hour gross means a 20-second time cycle or 18.2 seconds for work. To drill the deep holes in this time we used more than one unit, each drilling part depth.

Extra spindles on the vertical units allowed us to use low-cost standard tools instead of special combination tools.

We rebuilt this machine from equipment the customer returned to us. This saved him money, yet he has the regular Kingsbury new-machine guarantee, plus good basic design and rugged, accurate construction. His machine went right back into his production line because our test runs before shipment guaranteed uniform parts that gaged.

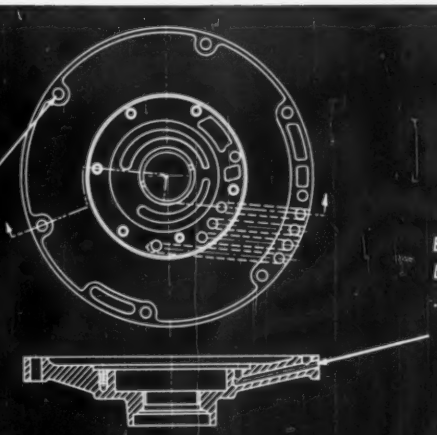
If you'd like to save money in drilling type operations, ask us to quote on a job. Kingsbury Machine Tool Corporation, Keene, N. H.

KINGSBURY

CAST IRON OIL PUMP HOUSING FOR AUTOMATIC TRANSMISSION

9 Vertical Units with 47 Spindles

DRILL – 22 HOLES
C'SINK – 13 HOLES
TAP – 8 HOLES
REAM – 1 HOLE
END MILL – 1 HOLE & 2 NOTCHES



9 Units with 17 Spindles 12° Downhill

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DRILL IN STEPS
.344 REAM
4 HOLES

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PIPE SUPPLY CO., INC.
ONE OF THE LARGEST STOCKS IN THE EAST
Seamless and Welded 1/8" to 26" O.D.
All wall thickness Manufactured.
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108 KOPPERS COKE OVENS
2 PUSHER MACHINES

CARS
800 Cu. Ft. Larry 14'8" Ga. 230V. DC (2)
65 Ton Hot Metal Std. Ga. w/65 Ton Ladles (4)
50 Ton Slag Std. Ga. w/300 Cu. Ft. Ladles (2)
50 Ton Slag Std. Ga. w/260 Cu. Ft. Ladles (2)
50 Ton Transfer Std. Ga. 230V. DC
10 Ton Quenching Std. Ga. 41'6" Wheelbase

OVERHEAD CRANES 230V. D.C.
110 Ton Cleveland Ladle 48'5" Span
20 Ton Shaw 41'7" Span, Cab Oper.
10 Ton Shaw 52' Span, Cab Oper.
10 Ton Bedford ¾ Yd. Bucket 61' Span

ELECTRIC BRIDGE 230V. D.C.
Traveling on Rail, 230' Span, plus 80' Cantilever, 6 Ton Bucket, Single Trolley, Motor Driven

MISCELLANEOUS
Penna. HAMMERMILLS SX13 400HP (3)
Koppers 2 Roll CRUSHER 36"x42", 40 HP
Trimmer CONVEYOR 30"x13'3" c/c Cleated
100 Ton PRINTOMATIC Larry Car SCALE, 14'8" c/c Rail
50 Ton 60' Platform Printomatic TRUCK SCALE
30 Ton 40' Platform Printomatic TRUCKSCALE
CAR HAULS Drum Type 20"x18", 25 HP
SKIP HOIST Lidgerwood 178'
MOTORS, DC Type CO & MD Series & Compound Wound 230V. 1 to 200 HP (100)
MOTORS AC 3/60/440V. Squirrel Cage & Slip Ring 1 to 100 HP (100)

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2—8" x 8" Waterbury-Farrel—25 HP DC Motor
2—8" x 8" Waterbury-Farrel (roll. brg.) 25 HP Motor
2—10" x 10" Blake & Johnson 40/65 HP DC Motor
All Mills with variable speed drives & Coilers, Edge Rollers, etc.
CURRY & HUDSON ASSOCIATES, INC.
ONE GATEWAY CENTER, PITTSBURGH 22, PA.

Detroit Dealers Look for Gains

Used machinery dealers in the Motor City are looking for increased sales soon.

The first quarter was slow. But now there are encouraging signs, the dealers say.

■ In line with the national picture, used machinery dealers in Detroit are looking for increased sales soon.

To these dealers, the first part of the year was unsatisfactory in sales and profits. Many point out that the slump that started in mid-December failed to change in January or February. This is in spite of increased activity on a nation-wide level in January.

March sales were slightly better than the rest of the first quarter. But estimates for the period as a whole put it slightly better than the fourth quarter of 1960 but as much as 20 pct below the opening period of 1960.

Hope and Anticipation — Now there is hope and anticipation that the second quarter will turn out better. Yet there is not really any solid evidence on which to base these hopes. About the only thread for used tool dealers to clutch is an increase in telephone inquiries. Some of these inquiries might be converted to sales.

"Still," says one manager of a large company, "it's as tough as ever to get a customer to part with a dollar."

Nevertheless, virtually all the dealers in the Detroit area say they are looking for better business in May. Auto sales and tool and die activity may play an important part in any rise of used tool sales. If things pick up in these areas, cautious customers might buy.

Limited Changes — But not too much help is expected from local tool and die shops. Changes on the 1962 cars will be rather limited, say tool and die officials. And foreign tool-making competition isn't helping the Detroit situation any.

Thus far in 1961, purchasing has been rather generalized with no real emphasis or interest in specific tool areas. There are reports of sales in tool and die equipment, grinders, and production-type lathes.

Auction Status—There are about the same number of auctions going on as there were earlier this year. However, a specialist in production equipment says he has avoided auctions because his inventory is high.

Generally, Detroit dealer inventories are very high. Some dealers are spot-buying rather than adding to their stockpiles. But there are also dealers attending auctions to see if they can come up with good, dependable used equipment that doesn't have to be rebuilt.

In the past three months, reports are that prices have fallen about 10 to 20 pct below the levels of late December. Now there are indications that the slide has ended and an upswing has started.

Exports Moving—Dealers in Detroit say exports are still moving at the same pace. Earlier this year, there seemed to be a setback in tool and die equipment shipments overseas. Now there seems to be just the slightest slowing down in production machinery.

As for the summer, the feeling seems to be one of encouragement. Activity is more spirited than that of the winter months.

COMPRESSORS

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1	1000	Whse.		500	800/2000
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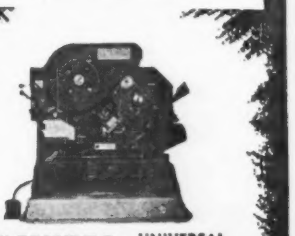

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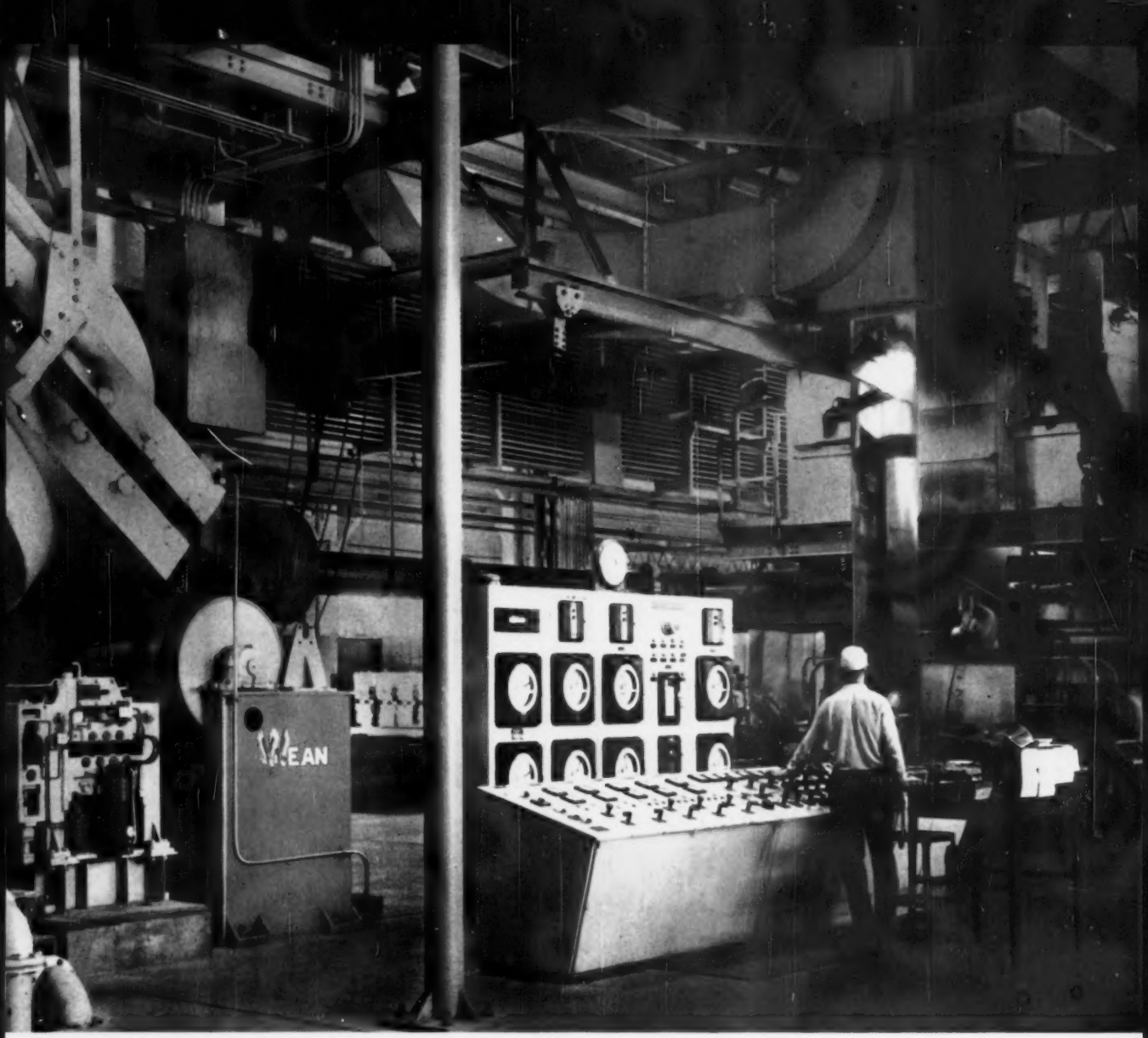

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